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An Optical and Ophthalmological Glossary of English Terms, Symbols and Abbreviations, together with the English Equivalents of some French and German Terms

RELATING TO

PHYSICAL, PHYSIOLOGICAL AND PATHOLOGICAL OPTICS, OPTICAL AND OTHER INSTRUMENTS OF PRECISION, AND TERMS DESCRIPTIVE OF COLOR AND PHOTO-CHEMISTRY,

TO WHICH ARE ADDED

A NUMBER OF GENERAL AND MATHEMATICAL EXPRESSIONS

EDITED BY

CHARLES HYATT-WOOLF, F.R.P.S.

Editor of "The Optician and Photographic Trades Review," etc.

PHILADELPHIA

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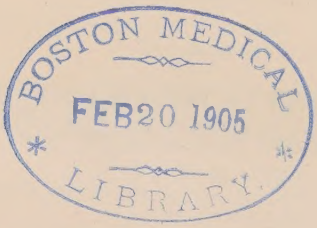

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PREFACE.

This work has been compiled mainly with a view to providing a handy and reliable compendium of optical terms for the use of students and members of the optical industry generally. It will likewise be found of service to medical students and surgeons interested more broadly in ophthalmic literature than the usual curricula demand. In order also that the work may prove helpful to as wide a circle as possible, there has been included a large number of terms, not strictly optical, pertaining to photography and instruments of precision, together with a considerable number of mathematical and general terms, definitions of which seemed likely to be of service to readers of optical literature, etc. Many French and German terms are in the same manner included for the purpose of assisting students in verifying, here and there, a short quotation written in those languages.

The arrangement of the dictionary is strictly alphabetical, that is to say, compound terms must be looked for under the first and not under the principal word of the combination. For instance: Spherical Aberration will be found under S. Total Reflection under T, etc.

Acknowledgment of indebtedness must be made to the following European and American sources of information which, to a greater or lesser extent, have been utilised:—Murray (New English Dictionary), Standard Dictionary of the English Langauge, The Encyclopædic Dictionary, The Century Dictionary,

Webster's International Dictionary, Frank P. Foster (Encyclopædic Medical Dictionary), Albert H. Buck (Medical Dictionary), R. I. Dunglison (Dictionary of Medical Science), G. M. Gould (New Medical Dictionary), G. M. Gould and W. L. Pyle (Diseases of the Eye and Refraction), H. Landolt (The Optical Rotating Power of Organic Substances), I. Le Conte (Sight), W. Bohne (Handbook for Opticians), S. P. Thompson (Light, Visible and Invisible), W. T. Emtage (Light), Paul Drude (Theory of Optics), Th. Preston (Theory of Light), Henry Van Heurck (The Microscope), J. Hogg (The Microscope), C. Beck and H. Andrews (Photographic Lenses), Otto Lummer (Photographic Optics), Wall (Dictionary of Photography), Woodbury (Dictionary of Photography), The Optician's Handbook, Fr. Valk (Errors of Refraction), Harry L. Taylor and William S. Baxter (Key to Sight Testing), G. Hartridge (The Ophthalmoscope), C. H. Brown (Optician's Manual), E. P. Thompson (Roentgen Ray).

In conclusion it is hoped that due allowance will be made for such deficiencies as are always liable to find their way into the first edition of a work of this kind. Suggestions for its correction, improvement, and expansion will be gladly received, and whenever possible they will be adopted in future editions or embodied in the form of errata and addenda and issued to purchasers of the work, whose names will be carefully registered for the purpose.

THE EDITOR.

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THE OPTICAL DICTIONARY.

A.

Abaiser. Ivory black; animal charcoal.

Abaxial. Not in the axis.

Abbe's Illuminator. An illuminating apparatus of very wide aperture for the microscope.

Abbildung (G). Formation of images.

Aberr, Aberrate. To deviate or diverge.

Aberrancy, Aberrance. A deviation or departure.

Aberrancy of Curvature. The extent to which a curve departs from a circle.

Aberrant. Deviating; wandering.

Aberrational. Characterized by aberration.

Aberration of Light. A slight error in the observed position of a celestial body, due to the fact that the velocity of the light by which it is rendered visible is compounded with that of the earth in its orbit.

Abducens oculi. The external rectus muscle of the eye, the action of which turns the globe outward.

Abducting Prisms. Prisms so held before the eyes as to cause divergence of vision.

Abirrung (G). Aberration.

Ablenkung (G). Deflection.

Ablepsia, Ablepsy. Blindness.

Ablese-Mikroskop (G). Horizontal microscope.

Abnormal Spectrum. A spectrum due to refraction.

Abschwächer (G). Reducer.

Abscissa. *See* Co-ordinate.

Absolute Near Point. The nearest point to which a single eye can be accommo-

dated, so as to retain distinct vision.

Absorbition. Absorption.

Absorption-bands. Dark bands in a spectrum indicative of the selective absorption of a part of the light.

Absorption-lines. Very narrow well-defined dark bands in an absorption spectrum, as in that of the sun (Fraunhofer's lines), due to selective absorption by highly heated matter.

Absorption of Colour. The elimination of an incident beam of rays of a certain wave-length, when light is reflected or transmitted.

Absorption Spectrum. A spectrum crossed by dark bands due to the absorption of light by the media traversed.

Abweichung, Ablenkung (G). Deviation.

Abweichung (G). Aberration.

Accelerate. In photography: To shorten the time of development.

Accelerator. (*a*) A substance or device by means of which the time of exposure of a sensitised plate to the light is shortened. (*b*) Any chemical substance added to the developer with the object of shortening the time required for development.

Accidental Colour. A retinal complementary, due to a deficiency in perception induced by retinal fatigue, as the subjective yellow disc seen upon a piece of white paper immediately after the eye has been fixed for a time on a blue wafer. A "negative retinal image" of the wafer is formed.

Accidental Light. In photography: A casual ray of light proceeding from a source to which the scene does not directly owe its chief effect.

Accommodation. The act of changing the refractive condition of the eye or of an optical instrument.

Accommodation power. The automatic adjustment of the eye, or its power of adjusting itself to distinct vision at different distances.

Accommodations-vermögen (G). The accommodative power of the eye.

Accommodative. Pertaining to the function of accommodation.

Acentric. Not central.

Achroite. Colourless tourmaline, found chiefly on the island of Elba.

Achromasia. Without colour.

Achromatic. Destitute of colour; transmitting light without decomposing it. (Apochromatic.)

Achromatic condenser. An achromatic lens which is placed between the mirror and the stage of a microscope, with the object of concentrating the light on the object.

Achromaticity. The quality of achromatism.

Achromatic lenses. Lens combinations of two separate lenses of different refractive and dispersive powers cemented together.

Achromatic telescope, or microscope. A telescope or microscope, in which the chromatic aberration is corrected; in most cases by means of an achromatic object glass.

Achromatize. To render achromatic; to deprive of colour or of the power of transmitting coloured light.

Achromatopsia, achromatopsy, or acritochromacy. Complete, or partial, colour-blindness.

Achromatous, achromous, achroous. Without colouring matter; colourless.

Achse (G). Axis.

Aclastic. Without the power to refract light.

Aclinic. Having no inclination.

Acronychal. Occurring at sunset.

Actinic. Pertaining to actinism.

Actinically. Used with reference to the chemical action of the rays of the sun.

Actinic process. A name for any kind of photographic process.

Actinism. The chemical activity of light.

Actino-electricity. Separation of electricity induced by the incidence of light or heat.

Actinograph. An instrument for measuring and recording variations of the actinic effect of the solar rays.

Actinology. The science of photo-chemistry.

Actinometer. An instrument for measuring the intensity of radiation by means of its

photo-chemical effect. (Tithonometer.)

Actinophone. An apparatus for the production of soniferous pulsations by the incidence of an intermittent beam of radiant heat. (Radiophone.)

Acyanoblepsy. Blue colour-blindness.

Adamantine spar. A peculiarly hard nut-brown variety of corundum used for polishing diamonds.

Adapter. (*a*) A metal ring uniting two lengths of a telescope. (*b*) An attachment to a microscope for centering the illuminating apparatus or throwing it out of centre. (*c*) A means of enabling object glasses made by different makers, and having different screws, to be fitted to a body not originally adapted to receive them.

Adducting prisms. Prisms used in ophthalmological examinations for producing convergence of vision.

Adiactinic. Impervious to the actinic rays.

Adiathermanous, adiathermic. Impervious to radiant heat.

Adjusting-cone. An instrument consisting of a pair of hollow cones adapted for measuring the distance by which the optical axes of the eye are separated, when both are directed towards a distant object.

Adomicometer. An instrument on the principle of the sextant.

Æolotropic. Non-isotropic.

Æolotropy. The state of being non-isotropic; exhibiting distinct properties in different directions.

Aerography, aerology. The branch of meteorology which deals exclusively with the atmosphere.

Aerometer. An instrument for indicating atmospheric pressure. (Barometer.)

Aerothermal. Pertaining to heated air.

Æthrioscope. A differential thermometer for indicating the variations in the intensity of radiation towards, or from the sky.

After-image. An image persistent upon the retina for some little time after any bright object has been fixedly looked at. Called *positive* when the colours of the after-

image are the same as those of the object, and *negative* when they are complementary thereto.

After-vision. The perception of an after-image.

Agate-glass. Ornamental glass, of variegated colours, made by fusing together scraps of different colours.

A grand angle (Fr). Wide-angled.

Agrandissement (Fr). Enlargement.

Air-brush. An atomizer for the distribution of colour by means of a blast of air.

Air-gauge. An instrument for the determination of gaseous pressure. (A manometer.)

Air-pyrometer. An air-thermometer adapted for the measurement of intense heat.

Alabastrian, or Alabastrine Positive. A collodion positive of which the precipitated silver is whitened by mercury.

Albedo. Whiteness; that part of the light falling on a surface which is irregularly reflected by it.

Albertype. A photo-mechanical process, by which prints in greasy ink are obtained by means of a film of gelatine in relief. (Collotype, Artotype, Phototype.)

Albescence. A condition of pale or moderate whiteness.

Albescent. Hoary or blanched.

Albinism. Abnormal deficiency of pigment in iris and choroid.

Albinotic, Albinistic. Affected with albinism (having pink eyes, etc.).

Albugo. Same as leucoma; a disease of the eye, characterised by opacity of the cornea.

Albuminimeter. An instrument for testing the quantity of albumen in a liquid.

Alcoholometer, Alcohometer. An instrument for determining the alcoholicity or alcoholic strength of a liquid.

Alethoscope. An optical instrument, the use of which renders pictures more lifelike and natural in appearance.

Aleurometer. An instrument for testing the expansion of the gluten in moist flour.

Alexia. Word blindness or text blindness (inability to read), the result of a nervous disorder which does not in-

volve the loss of sight generally.

Algorism, Algorithm. A method of notation in arithmetic or algebra.

Alidade, or Alhidade. An arm which moves over a graduated circle and carries a vernier.

Alineation, Alinement. The act of adjusting in line.

Allochroic. Changeable in colour.

Allochromatic. Pertaining to change of colour.

Allomerism. The retention of constant crystalline form, while the chemical constituents of the substance vary.

Allomorphism. Change of form without change in chemical constitution.

Allophanic. Having the property of changing colour.

Allotropy, Allotropicity. Peculiar modifications of form and chemical properties common to a single substance.

Almucantar, Almucanter. An astronomical instrument, consisting of a telescope, mounted on a box floating on mercury. The telescope is provided with horizontal wires.

Almucantar-staff. An instrument used for determining the altitude of the sun.

Altazimuth. A form of theodolite in which a vertical circle is attached to the axis of the telescope.

Altimeter. An instrument adapted for measuring altitudes, as a sextant.

Altiscope. An optical instrument having an elevated inclined mirror, with the aid of which it is possible to look over near objects which stand in the line of direct vision.

Amasthenic, Amacratic. Uniting all the actinic rays in one focus (used of photographic lenses).

Amaurosis. Loss of sight (without discoverable lesions) due to impaired sensibility of the retina.

Amblyopia, Amblyopy. Defective vision, where no disease of fundus or optical error is discoverable.

Amblyopia ex anopsia. Amblyopia resulting from one eye having been excluded for some time from the binocular visual act.

Ambrotype. A collodion positive on glass.

Ametallous. Non-metallic.

Ametrometer. An apparatus for use in testing the refraction and accommodation of the eye.

Ametropia. Abnormality in the refraction or accommodation of the eye, as myopia, hypermetropia, presbyopia, or astigmatism.

Amici's Prism. An illuminating device, consisting of a prism with one plane and two lenticular surfaces.

Amorphic, Amorphous. Uncrystallised.

Amphitype. A "magic" photographic process invented by Herschell.

Amplifier. A supplementary convex lens adjusted in front of the lens of a fixed-focus camera to facilitate the photographing of near objects.

Amplitude. The distance between the extreme limits of a vibration or oscillation.

Amplitude. The arc of the horizon, intercepted between the east or west point, and the center of the sun, or of a star at its rising or setting.

Amplitude Compass. An azimuth compass, the zeros of graduation of which are at the east and west points, to facilitate the reading of the amplitudes of celestial bodies.

Amplitude of Accommodation. The amount of accommodative effort the eye is capable of.

Amplitude of a Vibration. The maximum distance traversed by an individual particle whilst a complete vibration is performed.

Amylotype. A photograph produced by the action of light on living vegetable matter.

Anaclastic. Pertaining to the refraction of light; same as dioptric.

Anæsthesia of the Retina. Insensibility of the retina.

Analysis of Light. The resolution of light into its prismatic constituents.

Analyzer, Analyser. The second polarising prism in a polariscope.

Anamorphoscope. An optical toy, giving a correct image of a distorted picture.

Anamorphote Lens. A lens containing a cylindrical element, and in consequence distorting like a cylindrical mirror.

Anascope. An optical contrivance by means of which

the image in the camera can be viewed right side up.

Aneroid. A non-liquid barometer.

Anerythropsia. Red colour-blindness.

Angiomas. Bluish-red tumors on the eyelid.

Angle. The mutual inclination of two lines originating in one point and proceeding in different directions.

Angle de l'oeil (Fr). Angle of the eye.

Angle limite (Fr). Critical angle.

Angle of Curvature. The angle included by the tangent and an infinitesimal portion of a curve.

Angle of Incidence. The angle included between a ray of light incident on a surface and the normal to that surface at the point of incidence.

Angle of Polarization. That angle of reflection (varying with the character of the reflecting medium) at which a ray of light is most completely polarised.

Angle of Reflection. The angle included between a ray of light reflected from a surface and the normal to that surface at the point of reflection.

Angle of Refraction. The angle which a ray of light, after refraction at a surface, forms with the normal.

Angle-true. True in perspective or orthoscopic.

Angle variable (Fr). Adjustable angle.

Angular Aperture. The angular breadth of the pencil of light which a microscope transmits from the object or point viewed; the angle subtended by the effective diameter of the lens at the focal point.

Angular Magnitude. The measure of an angle.

Angular Velocity. The rate of increase of an angle; rate of rotation.

Angulometer. An instrument for the measurement of angles. (Goniometer.)

Aniridia, Aniridismus. Either congenital or traumatic absence or defect of the iris.

Anisocoria. Inequality in the diameter of the pupils.

Anisometropia. Inequality in the refractive power of the eyes.

Anisotropic. Æolotropic. Not isotropic.

Ankyloblepharon. Adherence of upper and lower eyelids.

Anoopsia. A variety of strabismus in which the eye is turned upward.

Anophthalmia. Absence of the eyes.

Anophthalmos. Absence of the eyes (congenital).

Anopia. Congenital absence of the eyes.

Anopsia, Anopsy. Congenital absence of both the eyes and the orbits.

Anoptus. Unseen, invisible.

Anorthopia. A defective state of vision in which parallel lines and symmetrical figures do not appear as such.

Anorthoscope. An instrument by means of which a distorted image is exhibited without distortion, comprising a rapidly rotated opaque front disc provided with slots and a transparent rear disc which is also rotated and whereon the image is mounted.

Anterior Synechia. Adhesion of the iris to the posterior surface of the cornea.

Anteocular, Antocular. Situated in front of the eye.

Anthrax of the Eyelids. A disease of the eyelids due to mortification of the tissues of the skin.

Anticaustic. A diacaustic curve.

Antinial. Relating to the space between the eyebrows.

Antiparallel. Running parallel, but in contrary directions.

Antiphotogenic. Opposed to photo-chemical action.

Antiplanat. A non-symmetric doublet, the front lens being positive and the back lens negative.

Antiprism. One of the opposed elements in a compound or chromatically corrected prism.

Antocular, Anteocular. Situated before the eye.

Aperiodic. Without periodicity.

Aperture. The diameter of the effective portion of the object-glass in a telescope or other optical instrument; the perforation in the top of an optical instrument.

Apertometer. An instrument for measuring the aperture of an objective.

Apertor. A term applied to the muscle which raises the upper eyelid. Usually called levator-palpebræ.

Apex of a Prism. The place where the two plane surfaces meet.

Aphacia, or Aphakia. Absence or displacement of the crystalline lens of the eye.

Aphelion. The point in a planet's orbit at which it is most distant from the sun.

Aphengescope.—A megascope or optical lantern for projecting the image of an opaque object.

Aplanatic, or Aplanetic. Without spherical aberration.

Aplanatic Lens. A lens or lens-system free from spherical aberration or divergence of light from the focus.

Apochromatic. Destitute of colour; transmitting light without decomposing it. (Achromatic.)

Apochromatic Correction. The elimination of the chromatic differences of spherical aberration.

Apochromatic Lens. A microscope objective almost completely free from chromatic aberration.

Apogee. The point in the orbit of a planet at which it is furthest from the earth.

Apomecometer. An instrument for measuring the distance of objects.

Apomicometer. An instrument on the principle of the sextant, used for measuring heights.

Apricate. To bask in the sun.

Appareil (Fr). Apparatus.

Appareil à déssiner (Fr). Drawing apparatus.

Appareil pour la réfraction de la lumière (Fr). Refraction apparatus.

Apparent Magnitude. The angle subtended by an object at the pupil of the eye.

Apparent Position. The position apparently occupied by an object seen through a diffracting medium, as distinguished from its real position.

Apparent Strabismus. An illusory appearance of squinting.

Approximation. A progressive approach towards a true result; the process of calculating the value of a quantity with constantly increasing exactness, without ever actually obtaining it.

Aqueous Chamber of the Eye. The space in the eye bounded by the cornea in front and by the ciliary processes, suspensory ligament and crystalline lens behind. It is divided by the iris in two unequal parts, the anterior and posterior chamber.

Aqueous Humor. A watery fluid which fills the space between the cornea and the crystalline lens in the eye.

Arc. Any part of a curved line.

Arc of Vision. The arc of the sun's distance below the horizon at the time a star becomes visible.

Arcus senilis. A narrow, elongated, crescent-shaped opacity at the margin of the cornea due to fatty degeneration of its corpuscles. (Gerontoxon.)

Area of Critical Definition. That portion of an optical image within which the detail is clearly defined.

Area System. A system of calculating relative exposure with various stops and lenses.

Argyll Robertson Pupil. A pupil habitually small, that does not contract under bright light, but does so promptly under accommodation efforts.

Armillary Sphere. An appliance to represent the motion of the solar system.

Arrhinencephalia. The condition of having only a single eye in the centre of the forehead. (Cyclopia and Synophthalmia.)

Artificial Light. Any light not proceeding from the celestial bodies.

Artificial Pupil. An artificial opening in the iris.

Artificial Horizon. A reflecting liquid surface used for measuring the double altitude of a heavenly body.

Astatic. Free from directive influence.

Asthenopia. Weak sight due to accommodative, muscular, or retinal causes.

Astigmatic Beam. A beam having no focus.

Astigmatic Fan. A device used in testing for astigmatism.

Astigmatism. (1) A defect in a lens or in the eye, due to the fact that the focal length varies in different planes through the axis. (2) An error in the focusing of an oblique pencil due to the fact

that it assumes a wedge-like form after emergence from the lens.

Astigmometry. The measurement of astigmatism.

Astignometer. An instrument for measuring the degree of astigmatism.

Astrography. A delineation or description of the stars.

Astrometer. A stellar photometer. (Astrophotometer.)

Astrometeorology. The deduction of meteorological indications from the appearances of the celestial bodies.

Astronomical Day, or Nautical Day. The mean solar day reckoned from noon to noon.

Astronomical Lantern. A lamp surrounded by an opalescent screen on which a stellar map is depicted.

Astronomical or Atmospheric Refraction. The deflection of a ray of light from a heavenly body by the atmosphere.

Astronomy. The science which describes the heavenly bodies and explains their apparent motions.

Astronomics. The science of astronomy.

Astrophotography. Stellar photography.

Astrophotometer. A stellar photometer. (Astrometer.)

Astroscope. A form of celestial globe.

Asymmetric. Non-symmetric.

Asynchronous. Not simultaneous; not synchronical.

Athermancy. Impermeability to radiant heat.

Athermanous, Athermous. Opaque to radiant heat.

Atmospheric Lines. In spectroscopy the part of Fraunhofer's lines due to the absorption of light rays by air.

Atrope Line. The normal to the plane of the axes of rotation of the eye.

Atropine. An alkaloid obtained from Atropa belladonna and similar plants.

Aufnahme (G). Exposure.

Aufnahmeperson (G). Operator.

Augapfel (G). Eyeball.

Augapfelbindehaut (G). Ocular conjunction.

Augapfellähmung (G). Paralysis of the iris.

Auge (G). The eye.

Augenblicksbilder (G). Instantaneous picture.

Augenentzündung (G). Any kind of inflammation in the eye.

Augenhöhlenwinkel (G). The angle of the orbit.

Augenlicht (G). Eyesight.

Augenhöhlenwinkel (G). Any disease of the eyelids.

Augenwinkel (G). Angle of the eye.

Annäherung (G). Approximation.

Aurèole (Fr). Halo or halation.

Auriscope. An instrument for examining the ear; an otoscope.

Auriscopy. Examination of the ear by means of an auriscope.

Auseinandergehen (G). Divergence.

Austauschbar. (G). Exchangeable.

Autophthalmoscope or Autoscope. An instrument for the self-examination of the interior of the eyes.

Autoptically or Autopsically. By one's own ocular observation.

Autotomic Line. A self intersecting line.

Austrittspupille (G). Exit-pupil.

Autolaryngoscope. An instrument adapted for self-examination of the larynx.

Autotype Process. The bichromatised gelatine printing process.

Auxometer. An instrument for determining the magnifying power of an optical system.

Axial. Forming an axis.

Axial, Axal, or Axile. Pertaining to, or situated in the axis.

Axial Illumination. Illumination in the line of the axis of a microscope.

Axially. In the direction of the axis.

Axifugal. Centrifugal.

Axis. Any fixed line of reference, as, in an optical system, the line which traverses the optical and geometrical centres.

Axis of Refraction. The normal to the surface of a refracting medium at the point of incidence of a ray of light.

Axis of a Beam of Light. The middle ray of the beam.

Axis of a Mirror. A straight line passing through the optical and geometrical centres of the mirror.

Axis of a Microscope or Telescope. The straight line connecting the centres of the objective and the eyepiece.

Axes of Light-elasticity. In a biaxial crystal the three directions at right-angles to each other, in which the elasticity of the light ether has its maximum, minimum, and mean value.

Axis of Polarisation. The line around which the figures caused by the action of polarised light are symmetrically arranged.

Axis of Rotation of the Eye. The axis around which the eyeball turns when one of its muscles contracts.

Axis of the Eye (optic axis). A straight line which passes through the centres of the crystalline lens and pupil.

Axiom. An universally accepted proposition or principle.

Axisymmetric. Symmetrical with respect to an axis.

Axometer. An instrument used in the adjustment of spectacle frames.

Axotomous. Susceptible of cleavage perpendicular to the axis.

Azimuthal. Pertaining to the angular distance from the north or south point in the horizon.

Azimuth Compass. A magnetic compass having vanes or alidades for taking the horizontal bearings of a celestial or other object.

Azimuth Dial. A dial of which the gnomon is at right angles to the horizontal plane.

B.

Bacillary Layer. The layer of rods and cones of the retina.

Back Focal Length. The distance between the back focus of a lens and the last lens surface.

Background. The part of a picture furthest from the eye of the spectator.

Backstaff. An old-fashioned appliance for the determination of the sun's altitude.

Bacterioscopy. The microscopic examination of bacteria.

Balance Barometer. A balance, having counterpoises of greatly different specific gravities.

Balance Thermometer. An instrument in which the thermal expansion of a liquid is determined from the displacement of its centre of gravity.

Band Spectrum. The discontinuous spectra of gaseous bodies, consisting of coloured bright bands.

Baric. Same as barometric.

Barograph, Barometrograph. A self-recording barometer.

Barometer. An instrument for indicating atmospheric pressure. (Aerometer.)

Barometer-gauge. A vacuum gauge.

Barrel-shaped Distortion. Distortion caused by a concave lens.

Baroscope. A barometer not intended to give exact quantitative indications. Same as balance barometer.

Baume du Canada (Fr). Canada balsam.

Beam. A number of nearly parallel rays of light.

Bell-cranks. A pair of coaxial cranks united to one another at right angles.

Beleuchtung (G). Lighting, illumination.

Beleuchtungsschirm (G). Reflector.

Beschleuniger (G). Accelerator.

Bestimmen (G). To ascertain, to determine.

Besiclometer. An instrument for measuring the forehead to determine the proper width of spectacle frames.

Beugungs-apparat (G). Diffraction apparatus.

Bevel, Bevel-square. An adjustable try-square.

Beweglicher Objektivtisch (G). Mechanical stage.

Bewegbarer Schirm (G). Movable screen.

Biaxial. Having two axes.

Biconcave. Hollow or concave on both sides.

Biconvex. Convex on both sides.

Bicylindrical Lens. A lens with two cylindrical faces,

whose axes are at right angles to each other.

Bifilar Micrometer. An optical micrometer having two threads.

Bifocal. Having two foci.

Bifocal Lens.—A lens, the upper half of which is adapted for viewing distant objects, whilst the lower half is adapted for viewing near objects.

Bild (G). Image.

Bildumkehrendes Prisma (G). Image-reversing prism.

Binary Lens. A double lens.

Binocle. A binocular telescope or opera-glass.

Binocular. (*a*) Of or pertaining to both eyes at once. (*b*) Having two eyes.

Binocular. An optical instrument adapted to be used with both eyes at once.

Binocular Microscope. A microscope in which the rays after passing through the objective are divided, a part of them passing through the eyepiece to the right eye, and another part to the left.

Binocular Parallax. The angle of convergence of the visual axes.

Binocular Stereoscopic Ocular. An ocular composed of two eyepieces about as far apart as the eyes, and connected with a tube acting as the eyepiece of a uniocular microscope.

Binocular Vision. Seeing with both eyes.

Biplanar. Lying in two planes.

Biprism. A prism of which the cross-section is a very obtuse-angled isosceles triangle.

Biquartz. A plane disc composed of two semicircular plates of quartz, one dextrorotatory and the other lævorotatory.

Birefringent. Birefractive; doubly refractive.

Birotatory. Rotating the plane of polarisation of light through an angle which is at first abnormally great, but decreases subsequently when the substance has been completely dissolved.

Bisymmetrical. Bilaterally symmetrical.

Black Mirror. A mirror deeply-coloured with iron and manganese, occasionally used as a reflector in cloud photography.

Blemmatrope. An apparatus for illustrating the different positions of the eye.

Blende (G). Diaphragm.

Blepharadenitis. Inflammation of the Meibomian glands.

Blepharitis. Inflammation of the edges of the eyelids.

Blepharophimosis. Congenital narrowing or shortening of the space between the eyelids.

Blepharoplasty. Transplanting a piece of skin to form a new eyelid.

Blepharorhaphy. Uniting the eyelids after removal of the eyeballs.

Blepharospasm. Muscular spasm accompanying inflammatory eye diseases.

Blepharostenosis. Congenital or acquired narrowing of the interpalpebral aperture.

Blind. Destitute of the faculty of sight.

Blindheit (G). Blindness.

Blind Spot. Optic disc. The termination of the optic nerve, as it pierces the eyeball, and spreads out to form the inner layer of the retina.

Blurred. A term applied to an image which shows an indistinct or double outline.

Bolometer. An instrument used for measuring very minute differences of radiant heat. (Thermic balance.)

Bowman's Layer of the Cornea. The anterior layer of the cornea.

Box Sextant. A compact form of sextant, chiefly used by surveyors.

Broken Telescope. A telescope, the tube of which is bent at right angles, a reflecting prism or mirror being inserted at about an equal distance from the object glass and its focus.

Brachymetropia, Brachymetropy. Short sight. Same as myopia.

Brachy-telescope. A form of reflecting telescope in which the small convex mirror is placed out of the axis of the large, somewhat inclined, reflector.

Brechungs-exponent (G). Index of refraction.

Brechungs-winkel (G). Angle of refraction.

Brechung (G). Refraction.

Brennlinie (G). Focal line.

Brennpunkt (G). Focus, focal point.

Brennweite (G). Focal length.

Brightness. The state, condition, or quality of being bright.

Brille (G). Spectacles.

Brilliancy. A term applied to photographic negatives to denote harmony of light and shade in the image, and absence of fog.

Broad-sighted. Having a wide angle of view.

Bronzed Glass. Glass rendered irridescent by superficial corrosion.

Brouillard lumineux (Fr). Bunsen burner.

Brücke Lens. A component microscope lens, adapted for use in dissecting, and comprising a double convex and a double concave lens, so arranged as to secure the advantage of considerable working distance in combination with short focal length.

Bulbar Conjunctiva. The mucous membrane covering the anterior third of the eyeball.

Bull's-eye. A plano-convex lens.

Buphthalmos. Ox-eyed. Enlargement of the eye due to infantile glaucoma. (Hydrophthalmos. Keratoglobus.)

Bussole (G). Compass.

C.

Cabinet noir (Fr). Dark room.

Cælometer, or Cœlometer. An instrument for illustrating the elements of astrography.

Caleidophone. An instrument in which a number of mirrors are so arranged that objects viewed through it appear repeated in symmetrical patterns. (Kaleidophone.)

Caligation, Caligo. Dimness of sight; darkness; obscurity.

Calorescence. The process of transforming thermal into luminous ether waves by the interposition of a body to be heated.

Calorific-paradox. The phenomena of the spheroidal condition.

Calotype. The negative photo process on paper, invented by Fox Talbot. (Talbotype.)

Camera. A dark chamber or box, having a lens or a system of lenses at one end, and a device for holding sensitive plates or films at the other.

Camera-lucida. A prism, by which the images of objects are reflected at right angles, and presented to the eye in such a manner as to facilitate their delineation on paper.

Camera obscura. An apparatus by means of which the images of external objects received through a convex lens are reproduced on a white surface at the focus of the lens.

Campani's Eyepiece. A negative eyepiece used with a microscope.

Canada Balsam. A transparent liquid resin obtained from the bark of the balsam-fir. It is used for mounting microscopic objects and cementing lenses.

Candescence. The emission of light by a body heated to a high temperature. (Incandescence.)

Candescent. Same as incandescent.

Candle-balance. An instrument used in photometry to determine the weight lost by a candle burning a given length of time.

Candle-power. The illuminating power of a sperm candle burning at the rate of 120 grains per hour.

Canescence. A whitish or hoary colour.

Cane Telescope. A telescope fitted in a walking-stick.

Cannular. Tubular.

Cannulated. Made hollow in the form of a tube.

Canthoplasty. An operation for enlarging the opening of the eye to lessen pressure and friction.

Canthorhaphy. The operation for sewing up the corner of the eye.

Canthus. The angle formed by the junction of the upper and lower eyelids.

Carbon Printing Process. (*a*) The autotype process. (*b*) A printing process in which carbon or a carbonaceous material is the pigmentary matter employed.

Cartesian Lens. A spherico-ellipsoidal lens, free from spherical aberration.

Caruncula lachrymalis. The pink triangular body at the inner corner of the eye.

Cassegrainian Telescope. A form of reflecting telescope in which the rays are reflected from a concave to a convex mirror, and back, through an aperture in the first, to the eye of the observer.

Cassette (G). Dark slide.

Catacaustic. A caustic curve formed by reflection.

Catadioptric. Involving both reflection and refraction of light.

Catadioptric or Catoptric Telescope. A reflecting telescope.

Catadioptrics. The branch of optics concerned with catadioptric phenomena.

Catalysotype. A calotype process in which iodide of potassium is replaced by iodide of iron in the preparation of the paper.

Cataphoria. The tendency of the right or left visual line to place itself below the line of normal vision.

Cataract. An opacity of the crystalline lens, or its capsule, or both.

Cataract Extraction. The operation of extracting a cataract.

Cataract Lens. A spectacle lens for use after an operation for cataract.

Catharise. To clean anything perfectly.

Cathetometer. A horizontal telescope, adjustable on a vertical standard, used for the accurate measurements of small differences of level. (Kathetometer.)

Cathode Rays. Invisible radiations proceeding from the cathode, and producing fluorescence at that part of the glass tube where they impinge.

Catopter, Catoptron. A reflecting optical instrument; a mirror.

Catoptric, Catoptrical. Pertaining to incident or reflected light.

Catoptric Cistula. A box, the sides of which are lined with mirrors which reflect and multiply the images of any object placed therein.

Catoptric Dial. A dial which indicates the progress of time by means of a mirror so adjusted as to reflect the light

towards the ceiling, where the hour-lines are delineated.

Catoptric Light. Light produced by means of reflectors instead of by lenses and prisms.

Catoptrics. That branch of geometrical optics which deals mainly with the principles of the reflection of light from polished surfaces.

Caustic Curve. A curve formed by the concourse or coincidence of the rays of light refracted or reflected from some other curve.

Cecity. Blindness.

Cecograph. A writing machine for the blind. (Chiragon.)

Celidography. A description of the markings of the sun or planets.

Cemented Lens. A lens composed of two or more components cemented together.

Centradiaphanes. Cataract due to opacity in the central portion of the crystalline lens of the eye.

Centrage. The condition in which the centres of all the refracting surfaces of the eye fall in the same straight line.

Centrad. Towards the centre.

Centralblende (G). Diaphragm between two lenses.

Central Ray. The middle ray of a pencil of light.

Centraxonial. Having the axis in a median line.

Centre de courbure (Fr). Centre of curvature.

Centre optique (Fr). Optical centre.

Centric, Centrical. Central.

Centricity. The state of being centrical.

Centrifugal. Flying off, or proceeding from a centre.

Centrifugence. Centrifugal tendency.

Centripedal. Tending towards, or moving in the direction of, the centre.

Centripetence, Centripetency. Centripetal tendency.

Cerulescent. Exhibiting a bluish colour.

Cerulific. Capable of exciting the sensation of a bluish colour.

Chalarion. A cyst of the eyelid. (Meibomian cyst.)

Chambre Binoculaire (Fr). Stereoscopic camera.

Chambre noir (Fr). Camera obscura.

Champ (Fr). Field of a lens.

Champ de netteté (Fr). Field of view.

Champ plat (Fr). Flatness of field.

Châssis (Fr). Dark slide.

Chercheur (G). Finder.

Chemical Focus. The focus of the actinic rays.

Chemical Microscope. A compound microscope, the objective of which is placed below the stage, whilst the rays are diverted upwards by means of a four-faced prism.

Chemi-luminescence. Emission of cold light, accompanied by chemical changes.

Chemischer Brennpunkt (G). Actinic focus.

Chemosis. A swelling of the ocular conjunctiva.

Chiaroscuro. The distributions of light and shade with their intermediate gradations.

Chiasmal. Pertaining to the optic chiasm.

Chiastometer. An instrument for determining the distance between the two eyes during convergence.

Chief Point. The point of intersection of the incident and emergent portion of a ray, if produced.

Chief Ray. A term sometimes applied to the central ray of an oblique pencil of rays.

Chiliagon. A plane figure of a thousand sides and angles.

Chiliahedron or Chiliaedron. A solid having a thousand sides.

Chiragon. A writing machine for the blind. (Cecograph.)

Chlorochrous. Having a yellowish-green colour.

Chord. That part of a straight line which is comprised between two points of intersection with a curve.

Choroid. The membrane which invests the posterior five-sixths of the central part of the eyeball.

Choroid Tunic. The choroid membrane.

Choroiditis, Chorioiditis. Inflammation of the choroid coat of the eye.

Chroma. Intensity of colour or distinctive hue.

Chromascope, or Chromatoscope. An instrument for the determination of the refractive index of coloured rays.

Chromasia. The colouring of the images produced by chromatic aberration.

Chromatic. Of, or belonging to, colour.

Chromatic Aberration. The departure from point-for-point imaging due to the different refrangibilities of the different colours of the spectrum.

Chromatic Polarisation. Polarisation attended by a peculiar and unusual display of colours.

Chromatics. The science of colours.

Chromatic Thermometer. An arrangement of glass plates, exhibiting the difference between their temperature and that of an object with which they are brought in contact by the different hues of polarised light produced in them.

Chromatic Vision. A defect of sight in which all objects appear to be of a certain colour.

Chromatelopsis, Chromatodyopsia, Chromatometablepsia, Chromatopseudoblepsia, Chromatopseudopsia. Colour blindness.

Chromatism. Chromatic aberration or dispersion.

Chromatogenous. Generating colour.

Chromatograph. To represent in colours.

Chromatography. A treatise on colours.

Chromatology. The science of colours, the scientific investigation of matters pertaining to colours.

Chromatometer. A scale for measuring distinctions of colour.

Chromatopsia, Chromatopsy. A condition of the eye in which all objects appear in one particular colour. (Chromopsia, Chromopsy.)

Chromatoscope. (*a*) A reflecting telescope for studying the scintillations of stars. (*b*) An appliance for combining the different coloured rays into one component colour.

Chromatoptometry. Examination of the eye to test its sensibility to rays of various wave-lengths.

Chromatoscopy. The examination of the colour of bodies.

Chromatoskiameter. An

apparatus for testing the sense of colour.

Chromatrope, or Chromotrope. (*a*) A kaleidoscopic lantern slide. (*b*) A toy colour-disc, giving the effect of a stream of colour flowing to or from the centre.

Chromeidoscope. A form of kaleidoscope having two mirrors placed at an angle of 70°.

Chromiometer. An appliance for estimating the optical purity of water.

Chromogenic, Chromogenous. Producing colour.

Chromophotography. Photography in colours.

Chromopsia, or Chromopsy. A condition of the eye in which all objects appear of a particular colour. (Chromatopsia, Chromatopsy.)

Chromoptometer. An instrument for determining the sharpness of the colour sense.

Chromostroboscope. A stroboscopic instrument having variously coloured designs.

Chronobarometer. A clock, the pendulum of which is a mercury barometer.

Chronophotography. The art of obtaining a series of photographic pictures showing the successive positions of a moving object after short and equal periods of time have elapsed.

Chroopsia. Same as chromatopsia.

Cilia. The eyelashes.

Ciliary Muscle. A muscle by the contraction of which the shape of the crystalline lens, and therefore the accommodation of the eye, is modified.

Ciliary Zone. A thin, transparent membrane extending from the ciliary processes to nearly the equator of the lens, where it is intimately connected with the anterior capsule. (Zonule of Zinn.)

Cinerescent. Of an ashy-grey colour.

Circle-cutter. A tool for cutting circles of microscope glass.

Circle of Altitude. See Almucanter.

Circle of Curvature. The circle whose radius of curvature at any point of a curve is equal to that of the curve.

Circle of Dissipation. The circular area upon the retina within which the image of a luminous point is formed.

Circle of Least Confusion. The nearest approach to a

well-defined image of the point source.

Circulable. Capable of being circulated.

Circular Micrometer. A graduated metal annulus mounted on a parallel plate of glass at the focus of an astronomical telescope.

Circular Polarisation. A condition in which the ether particles vibrate in a circular motion in a direction transverse to that of the ray.

Claude Glass, Claude Lorrain Mirror. A convex blackened glass.

Clear-melting. The maintenance of glass in a molten condition for a sufficient length of time to permit impurities to settle.

Clepsammia. An hour glass.

Clichè (Fr). Negative.

Clichè posè (Fr). Time exposure.

Climatometer. A thermometer or thermoscope intended for meteorological use.

Clockwise. In the direction of the rotation of the hands of a clock.

Coaxial or Coaxal. Having a common axis.

Coddington Lens. A glass sphere having an equatorial groove.

Collimate. To render parallel.

Collinear. Lying in one and the same straight line.

Collodiotype. A photograph produced by the collodion process.

Colloid. A substance of the gelatine class which does not, when in a state of solution, pass easily through such membranes as parchment paper.

Collotype. A photomechanical process by which prints in greasy ink are obtained by means of a film of gelatine in relief. (Albertype, Artotype, Phototype.)

Collyrium. Any medicinal lotion for the eyes.

Coloboma. A fissure of parts of the eye.

Colour. (*a*) A sensation produced by the impact of ether waves upon the retina. (*b*) One of, or a mixture of, the different tints into which white light can be decomposed.

Colourate. Tinged with colour.

Colourational. Colourific; dependent on or pertaining to colour.

Colour Blindness. An infirmity of the human eye manifesting itself in an inability to distinguish certain colours.

Colourimetry. The measurement of colours.

Coma. The hazy border which surrounds an object which is viewed through an imperfect lens.

Compass. An instrument for determining direction, as a rule by means of a magnetic needle capable of rotating in a horizontal plane.

Compensating Ocular. An eyepiece specially adapted for use with achromatic objectives, so as to compensate for aberrations outside the axis.

Compensation of Errors. A method of obtaining an approximately correct result by causing one error to neutralise the other.

Complementary Colours. Any two colours which together produce white light.

Compound Lens. A combination of two or more lenses.

Compound Microscope. A microscope comprising a converging lens or lens-system—the objective—and an ocular, acting as a single microscope.

Compound Prism. A number of prisms cemented together.

Compound Spectacles. Spectacles fitted to receive extra coloured glasses.

Concave. In optics, a lens hollow or depressed in the centre.

Concave-convex Lens. A lens with one concave and one convex face, the curvature of the latter being the greater.

Concave Cylindrical Lens. A lens, the surface of which is similar to the inner surface of a cylindrical tube.

Concentric. Having a common centre.

Condensateur (Fr). Condenser.

Condenser. A lens, or a system of lenses, by means of which light is concentrated on one point.

Condenser-hygrometer. A dew-point hygrometer.

Cone de lumière (Fr). Cone of rays.

Cone of Rays. All the rays which, originating from a

given point, fall on a given flat surface.

Congenital Amblyopia. Amblyopia existing from birth.

Conical Cornea. An abnormal curvature of the cornea. (Keratoconous.)

Conical Refraction. The refraction of a single ray into an infinite number of rays in the form of a hollow luminous cone.

Conjugate Foci. Two points so situated in relation to each other that the direction of a ray proceeding from either of them, after reflection or refraction, passes through the other.

Conjugate Mirrors. Two parabolic mirrors so placed face to face that rays of light emanating from the focus of either are reflected in parallel lines to the other, and thence to its focus.

Conjunctiva. A thin mucous membrane covering the inner surface of the eyelids and a portion of the sclera.

Conjunctivitis. Inflammation of the conjunctival mucous membrane.

Conoscope. A form of polariscope for the observation of crystalline sections.

Consecutive Images. Images following each other in regular order.

Contact Goniometer. A goniometer in which the adjustments are made by mechanical as distinguished from optical methods.

Contact Lens. A thin glass shell, bounded by concentric spherical surfaces, and used for improving the sight in cases of abnormal curvature or opacity of the cornea.

Contact-level, or Contact Lever. An instrument consisting of a delicate spirit level in combination with levers for detecting minute differences of length.

Continuous Spectrum. A spectrum in which the different colours fade gradually into each other.

Contralateral. Occurring on the opposite side.

Contraplex. Simultaneous transmission in contrary directions.

Conus. A crescentic patch of atrophic choroid tissue near the optic papillæ in myopia.

Convergence. The state of being convergent.

Convergent. Tending towards a common point.

Converging Lens. A lens, either double-convex, plano-convex, or concavo-convex, which causes all the rays of a pencil of light to converge at a point.

Convex. In optics, a lens or a mirror with a spherical surface.

Convex Cylindrical Lens. A lens, the surface of which is similar to the outer surface of a cylindrical tube.

Convexo-concave Lens. A lens, the radius of curvature of the concave face of which is less than that of the convex face. (Meniscus lens.)

Convexo-convex. Same as double convex.

Convexo-plane. A lens with one plane and one convex surface. (Plano-convex.)

Convulsive Tic. Involuntary jerking, or twitching movements of the combined ocular muscles.

Co-ordinate. A magnitude belonging to a system of magnitudes which serves to define the positions of points, lines or planes with reference to some fixed figure.

Copopsia, Copyopia. Weakness or fatigue of sight.

Coquille Glasses. Glasses shaped like a watch crystal.

Corectasis. Dilation of the pupil of the eye.

Corectopia. Displacement of the pupil. (Korectopia.)

Coreometer. An instrument for measuring the diameter of the pupil.

Coredialysis. Detachment of the iris from the ciliary body. (Iridodialysis.)

Coreoncion. An instrument for drawing out a portion of the iris.

Corephthisis. Habitual contraction of the pupil.

Coreplasty. Formation of an artificial pupil.

Corestenoma. Partial closure of the pupil.

Cornea. The anterior transparent segment of the outer coat of the eye.

Corneal Astigmatism. Astigmatism due to causes arising in the cornea.

Corneal Corpuscles. A variety of connective-tissue corpuscles found in the parenchyma.

Corneal Facets. Small flattened areas on the surface of the cornea.

Corneal Microscope. A microscope, so constructed as to give an enlarged view of the cornea and iris.

Choroid Coat. The middle coat of the posterior portion of the eyeball.

Corps de la monture (Fr). Lens tube.

Corps lumineux (Fr). Luminous body.

Corpuscular Theory. The theory according to which light consists of excessively minute material particles darting out in all directions from the luminous body.

Correction. The elimination of aberration from a lens.

Cortical. Pertaining to an outer layer.

Cortical Blindness. Permanent loss of vision.

Cosmosphere. A terrestrial globe mounted within a hollow glass celestial globe on which the constellations are depicted.

Couching. The operation of depressing a cataractous lens into the vitreous chamber, there to be absorbed.

Courbure de champ (Fr). Curvature of the field.

Courbure de la surface focale (Fr). Curvature of the field.

Couvercle d'objectif (Fr). Cap of the lens.

Cover-glass. The glass covering the microscopic object.

Cover-slip. A thin piece of glass used to cover microscopical preparations.

Co-vibrate. To accompany with, or respond to by simultaneous vibrations.

Cribrate. Perforated like a sieve.

Critical Angle. The least angle of incidence at which a ray of light travelling in a denser medium is totally reflected at the surface which separates it from a rarer medium.

Crookes Tube.—A name given to every kind of high vacuum tube suitable for *x*-ray work.

Crossed Diplopia. Diplopia due to divergent squint or paralysis of the internal rectus.

Crossed Lens. A double-convex lens, the curvature of one face of which is six times that of the other.

Cross-eye. Internal strabismus.

Cross-hair, Cross-wire, Fibre-cross. A fine strand, as of spider's thread, or a pair of parallel or transverse wires or strands, mounted in the focal plane of an optical instrument.

Cross-section. A section at right angles to the principal axis. (Transsection.)

Cross-staff. A surveying instrument consisting of two pairs of sights crossed at right angles.

Crown Glass. A glass composed of silica, potash and lime, which does not contain lead or iron.

Crown of Aberration. A circle of light around the disc of the sun, due to the aberration of the solar rays.

Crystal. Substances occurring in definite geometrical forms, which are always the same for the same substance.

Crystallic. Pertaining to crystals or crystallisation.

Crystalliferous. Containing crystals.

Crystallin. A constituent of the crystalline lens of the eye.

Crystalline Lens. A biconvex transparent body, lying behind the pupil of the eye.

Crystallinity. Crystalline structure.

Crystalliser. A vessel for crystallisation.

Crystallogenic, Crystallogenical. Crystal producing.

Crystallogeny. That department of crystallography which treats of the production of crystals.

Crystallographic, Crystallographical. Pertaining to crystallography.

Crystalloid. A crystalline body which in a state of solution diffuses readily through such membranes as parchment paper; opposed to colloid.

Crystallology. The science of crystallography.

Crystallomagnetic. Pertaining to the magnetic properties of crystals.

Crystallometry. The measurement of crystals.

Crystallotype. A photograph on glass or any other transparent support.

Crystallurgy. The process of crystallisation.

Cubangle. The solid angle of a cube formed by three edges

meeting at right angles to each other.

Cubangular. Resembling one of the solid angles of a cube.

Cullet. Broken crown-glass intended for re-melting. (Ladled glass.)

Culture-cell. A microscope cell adapted for the culture of bacteria.

Culture Tube. A tube specially prepared for the growth of artificially developed bacteria.

Curvate, Curvated, Curviform. Curved.

Curvation. Curving or bending.

Curvature. The rate of deviation of a curve from a straight line, or of a curved surface from a plane.

Curvature of Field. See Field of a Lens.

Curve of Sines, Tangents, etc. A curve of which the abscissæ are proportional to angles whose trigonometrical functions are measured by the ordinates.

Curvity. Curvature.

Curvulate. Slightly curved.

Cyan-blue. A greenish blue.

Cyanean, Cyaneous. Of an azure colour; cerulean.

Cyanochroic, Cyanochrous. Of a bluish colour.

Cyanometry. The measurement of the blueness of the sky.

Cyanotype. A photograph made by the ferro prussiate process.

Cyclitis. Inflammation of the ciliary body.

Cycloid. A plane curve generated by a point in the circumference of a circle rolling upon a straight line.

Cyclopia. The condition of having a single eye in the centre of the forehead. (Arrhinencephalia, Synophthalmia.)

Cyclopion. The white of the eye. (Aristotle.)

Cycloplegia. Paralysis of the ciliary muscle.

Cycloplegic. A drug used for the purpose of first dilating the pupil and then paralysing the action of the ciliary muscle.

Cyclorama. A circular panorama.

Cyclostat. An optical instrument for examining a rotat-

ing body in a state of apparent rest.

Cylindrical Lens. A lens with one or two cylindrical surfaces.

Cylindricity. Cylindrical form.

Cylindricule. A small cylinder.

Cylindriform. Cylindrical.

D.

Dacryoadenitis. Inflammation of the lachrymal gland.

Dacryocystitis. Inflammation of the lachrymal sac.

Dacryocystoblennorrhea. Flow of tears from the lachrymal sac.

Dacryolite, Dacryolith. A calculus in the lachrymal duct.

Dacryoma. A diseased condition of the lachrymal duct, obstructing the flow of tears to the nose.

Dacryops. Watery eyes.

Daguerreotype. A photograph made on a surface of silver sensitised with iodine and developed by mercury.

Daltonism. Partial or complete colour-blindness. (Achromotopsia.)

Dark Lantern. A lantern with a slide or contrivance for concealing the light.

Day-blindness. A visual defect in which objects are only seen distinctly by a dim light; night-sight.

De-aerate. To free from air.

Debuscope. A form of kaleidoscope having two mirrors placed at an angle of 10°. (Chromeidoscope.)

Decagon. A plane figure of ten sides and angles.

Decahedron. A solid of ten faces.

Decangular. Having ten angles.

Decentering. The process of so mounting a lens that its optical centre is not directly in front of the pupil.

Decentred Spectacles. Lenses having a slightly prismatic action.

Deckel (G). Cover.

Declination. The complement of the polar distance of a celestial body.

Declinator, Declinometer. An instrument used for the measurement of declination.

Declinograph. A recording declinator.

Decolour, Decolourate. To decolourise or bleach.

Decomposition of Light. The resolution of a beam of light composed of different wave-lengths or colours into its constituent wave-lengths or colours.

Decurve. To curve downwards.

Definition. The accurate focusing of the rays proceeding from an object point in the corresponding image point.

Definition sur les Bords (Fr). Marginal definition.

Deflection or Inflection. A bending of the rays of light.

Delamination. A splitting apart in layers.

Demicircle. A simple azimuth instrument, embracing a magnetic compass, alidade and graduated semicircle.

Demonstrations Microscope. Either a simple or compound microscope, which may be passed from hand to hand to show some object; or a large compound microscope mounted on a rotating stage on which objects may be placed and brought in the field of view by rotating the stage.

Deplanate. Flattened or made level.

Depolarisation. The act of destroying the effects of polarisation.

Depolarise. To change the direction of polarisation of a polarised ray.

Depolariser. An apparatus used in bringing about depolarisation.

Depolish. To dull, or remove the glaze, from a surface.

Depression of a Cataract. The oldest method of operating for cataract.

Depth of Definition. The property of a photographic lens of producing a sharp picture of objects situated at various distances from it.

Depth of Focus. The power of a lens of giving a distinctly defined image of objects not in the same plane.

Depth Perception. The ability of the eye to distinguish between the relative position of distant objects.

Der blinde fleck (G). The blind spot.

Descemetitis. Inflammation of Descemet's membrane.

Descemet's Membrane. The posterior elastic membrane of the cornea and its endothelial coating. (Membrane of Demours.)

Desilicate. To deprive of silica.

Detachable Fronts. An arrangement by means of which one lens of a camera can be quickly changed for another.

Development. In photography: The process of rendering the latent image visible.

Developer. A chemical bath for developing a photograph.

Dexiotropic, Dextrotropous. Turning towards the right.

Dexter-diagonal. A diagonal from the upper left hand to the lower right-hand angle.

Dextrad. Towards the right side.

Dextro-compound. Any substance which rotates dextrally the plane of polarisation of light.

Dextrogyrate. Turning the plane of polarisation to the right.

Dextrogyrous. Circling to the right.

Dextrorotation. Rotation to the right.

Diactinic. Transmitting actinic as well as non-actinic rays.

Diagonal. An oblique line, or one joining opposite angles.

Diagonal Eyepiece. An eyepiece upon which, by means of a reflector, the rays of light are made to fall perpendicularly to the axis of the apparatus.

Diagraph. An optical instrument in which the motions of a tracing point, over a projected image, cause the outlines of such image to be recorded.

Dialysis. The mechanical separation of crystalloid from colloid bodies by diffusion.

Dialytic Telescope. A telescope in which achromatism is effected by means of two lenses separated some distance from each other.

Diametral, Diametric, Diametrical. Pertaining to a diameter.

Dianodal. Passing through a node.

Diaphaneity. Transparency; pellucidness; the capacity of transmitting light.

Diaphanometer. An instrument for the estimation of degrees of transparency.

Diaphanoscope. (1) A camera for the exhibition of photographic transparencies. (2) An apparatus for illuminating the internal parts of the body.

Diaphanoscopy. The process of making an examination by means of the diaphanoscope.

Diaphanotype. A coloured photographic positive superposed on a duplicate monochrome print.

Diaphanous. Transparent; translucent.

Diaphragm. A perforated disc or metal plate used to cut off marginal rays.

Diaphragmal, Diaphragmatic. Pertaining to a diaphragm.

Diapositiv (G). Transparency.

Diapositive. A positive made from a negative.

Diathermal, Diathermanous, Diathermic, Diathermous. Readily permeable by heat rays.

Diathermance, Diathermancy, Diathermaneity. Transparency to radiant heat.

Diathermanism. The transmission of radiant heat.

Diathermometer. An instrument for the measurement of diathermancy.

Diatomist. A microscopist who has made a special study of the *diatomaceæ*.

Diatomite. Diatomaceous or infusorial earth.

Diatomoscope. A microscope adapted for the examination of diatoms.

Diatom Prism. A form of prism used in microscopy, which gives the most suitable light for observing very fine lines or markings.

Dichromatic, Dichromic, Dichrous. Relating to two colours only.

Dichroscope. An instrument for the examination of dichroism in crystals.

Dichtigkeit (G). Density. Solidity.

Differential Refraction. Astronomical refraction to which is due a change in the apparent relative position of two objects.

Differential Thermometer. A thermometer for measuring differences of temperature.

Difform. (*a*) Irregular in form; (*b*) dissimilar.

Diffraction. A deviation of a ray of light from the straight path, when it passes over the edge of an opaque body or through a ruled screen. (Inflection, Inflexion.)

Diffraction Grating. Plates of glass or polished metal closely ruled with parallel lines.

Diffraction Plate. A grating formed of alternately long and short parallel lines.

Diffraction Spectroscope. A spectroscope in which the prism is replaced by a grating.

Diffraction Spectrum. A spectrum produced by passing light through a grating.

Diffractively. In a diffractive manner.

Diffrangibility. Susceptibility to diffraction.

Diffrangible. Capable of being diffracted.

Diffusion of Heat or Light. The scattering of rays by irregular or dispersive reflection.

Diffusitivity. The capacity or rate of diffusion.

Dilatability, Dilatancy. Capability of expansion.

Dilatable. Susceptible of expansion.

Dilatant. Expanding or assuming a state of dilatation.

Dilatator iridis. The muscle by which the iris is dilated.

Dilative. Tending to dilate; causing dilation.

Dilatometer. An apparatus making use of interference phenomena to determine thermal expansion.

Dioptre or Diopter. (*a*) A dioptric; (*b*) an alidade.

Dioptric. (*a*) Pertaining to dioptrics or the science of refracted light; (*b*) a measure of refractive power, being the ratio of one meter to the focal length of the lens. In this sense also written *dioptry.*

Dioptrically. By reflection.

Dioptric Light. Light in which the beam is produced by refraction.

Dioptrics. That branch of optics which deals with the refraction of light on passing through different media.

Dioptometry. Determination of the refraction and accommodation of the eye.

Dioptoscopy. A method of determining the refraction of the eye by means of the ophthalmoscope.

Dioptron (pl. Dioptra). A speculum for surgeons' use.

Diorama. A painting, or a number of paintings, arranged for spectacular exhibitions.

Diplantidian Telescope. A telescope showing two coaxial images, and intended for stellar transit work.

Dipleidoscope. An instrument used for determining the meridian transit of a celestial body.

Diplopia, Diplopy. A defect of the eye resulting in double vision.

Diplopic. Affected with, or caused by, diplopia.

Dipper. A holder for lowering a photographic plate into a vertical bath.

Diprismatic. Doubly prismatic.

Dip-sector. A form of sextant.

Diradiation. The emission of rays of light, heat, etc., from a heated body.

Direct Rotation. Circular motion in the counterclockwise direction, *i. e.*, such that the inside of the circuit always lies on the left-hand side.

Direct Vision. Vision in the direction of the visual axis.

Direct Vision Spectroscope. A series of prisms giving dispersion with a minimum of deviation.

Dischromatopsia. A kind of colour-blindness, in which all colours are seen less distinctly than normal; leading to confusion of near shades of same colour.

Disciform, Discoid, Discoidal. Resembling a disc or annulus.

Discission. An operation for soft cataract in order to cause its complete absorption.

Dispersing or Divergent Lens. A double concave, plano-concave, or convexo-concave lens which causes the rays of light to diverge in such a manner that instead of coming to a focus they seem to come from an imaginary focus situated at the same time as the incident ray.

Dispersion. The divergence of rays of light of different

wave-lengths, due to inequalities of refraction.

Dispersion of the Optic Axes. The variation in the value of the axial angle for rays of different wave-length.

Dispersion Photometer. A photometer for determining the intensity of very brilliant light sources.

Dispersive. Having the power of causing the different coloured rays of a beam of light to diverge.

Dispersive Power. The power of an optical instrument of separating colours so as to form a spectrum.

Disque colorié (Fr). Colour disc.

Dissecting Microscope. A simple or compound microscope, for monocular or binocular vision, used in dissecting very minute objects.

Dissipable. Liable to dispersion.

Dissolving Views. Pictures shown on a screen, and made to change gradually into the succeeding pictures.

Dissymmetric, Dissymmetrical. Without symmetry.

Distance focale (Fr). Focal length.

Distichiasis. A double row of eyelashes, part of which irritate the cornea.

Distortion. In photography: The inability of reproducing straight lines in the object as straight lines in the image.

Diurnal Motion. The apparent motion of the heavenly bodies from east to west.

Divergence. The separation of the eyes from each other by abduction.

Divergent. Separating from a common centre.

Divergent Rays. Rays continually diverging further and further from each other, the more they recede from the object.

Divided Spectacles. Spectacles, each lens of which consists of two parts, one for distant and one for near sight.

Dodecagon. A polygon of twelve sides and angles.

Doppelobjectiv (G). Doublet lens.

Doppelspalt (G). Double slit.

Double-bodied Microscope. A microscope which is so constructed that the object under examination can be observed simultaneously by more than one person.

Double-concave. Concavo-concave.

Double Concave Lens. A lens, both surfaces of which are concave.

Double-convex. Convexo-convex.

Double Convex Lens. A lens, both surfaces of which are convex.

Double Extension. An arrangement by which the base-board of a camera can be extended to nearly double its length.

Double-image Prism. An Iceland spar prism, giving two images of equal intensity, but polarised in planes at right angles to each other.

Double Refraction. The phenomenon resulting in the separation of a ray of light, when striking an anisotropic medium, in two unequally refracted rays.

Doublet. A pair of lenses so combined as to reduce aberration.

Draw Tube. A tubular sliding support in optical instruments.

Drehachse (G). Axis of rotation.

Drehblende (G.) Revolving diaphragm.

Drehen (G). To rotate.

Drop-shutter. A rapid photographic shutter.

Dry Objective. An objective is called "dry" when the slip covering the object is separated from the objective by a layer of air.

Dumb Telescope. A telescope tube without glasses, for sighting only.

Dunkelzimmer (G). Dark-room.

Durchmesser (G). Diameter.

Durchschnittspunkt (G). Point of intersection.

Durchsichtig (G). Transparent.

Dynactinometer. Same as actinometer.

Dynameter. A graduated glass plate used to determine the magnifying power of a telescope.

Dyschromatopsia, Dyschromatopsy, Dischromatopsis. Feeble or perverted colour-sense.

Dysopia, Dysopsia, Dysopsy. Painful or defective vision.

E.

Ebenheit des Feldes (G). Flatness of field.

Ebullioscope. A thermometric instrument for determining the boiling point of spirits.

Eccentric, Excentric. Not in the centre, not having the same centre.

Echelon-lens. A lighthouse projector, consisting of a series of annular lenses arranged concentrically in echelon.

Echimosis. A term used to describe the effusion of blood into the loose cellular tissues of the orbital cavity.

Eclairage (Fr). Lighting.

Eclairage inoffensif (Fr). Non-actinic light.

Eclimeter. An instrument for approximately measuring the vertical angles or zenith distances of objects on the horizon.

Ecran d'eclairage (Fr). Reflector.

Ecran mobile (Fr). Movable screen.

Ectasia. Abnormal distention or dilatation.

Ectopia Pupillæ. When the pupils are not in the centre.

Ectropion. Eversion of an eyelid. (Ectropium.)

Effective Aperture or Working Aperture. That part of the aperture of the lens actually used to obtain the image.

Egg Tester. A simple optical instrument for determining the transparency of eggs.

Egyptian Ophthalmia. A form of conjunctivitis characterised by the unrestricted formation of follicles, producing permanent granular masses. (Granular Conjunctivitis, Trachoma.)

Eidoscope. A form of kaleidoscope.

Einfaches Objectiv (G). Single landscape lens.

Einfall (G). Incidence.

Einfallswinkel (G). Angle of incidence.

Eintauchung (G). Immersion.

Einstellen (G). To focus.

Einstell-loupe (G). Focusing magnifier.

Einstellschraube (G). Focusing screw.

Eintritts-pupille (G). Entrance pupil.

Elaterometer. A pressure gauge.

Elatrometer. A vacuum gauge.

Element. In optics: One of a number of parts composing a symmetrical whole, for example—a lens.

Elliptically Polarised Light. Light wherein the ether particles vibrate in elliptic paths.

Elliptoid. Somewhat resembling an ellipse.

Embryograph. A microscope fitted with a camera lucida, used in embryological work.

Embryoscope. An instrument for the optical examination of embryologic development.

Embryoscopic. Pertaining to the examination of embryos.

Emergence. The process of coming forth.

Emergent. Said of a ray of light after passing through a refracting medium.

Emission Theory. The corpuscular theory of light.

Emissive, Emittent. Radiating.

Emissivity. Radiating power.

Emmetrope. A person having eyes normally refractive.

Emmetropia, Emmetropy. Normal visual power of accommodation.

Empfindlichkeit (G). Sensitiveness.

Empirical, Empiristic. Derived from experience or experiments.

Empiricism, Empirism. The empirical method.

Emulsion. In photography: A term applied to a mechanical mixture of a sensitive salt of silver very finely divided.

Encolour. To colour.

Endomersion Objective. A combination of lenses in contact with one another, the central element being a liquid.

Endoscope. A surgical instrument designed for the optical examination of internal portions of the body.

En Echelle (Fr). Disposed like the steps of a ladder.

En froid (Fr). In the unheated condition.

Engyscope, or Engiscope. A reflecting microscope.

Enhydric, Enhydrous. Containing water.

Enopthalmos. A condition in which the eye is less prominent than normal.

Enorthotrope. An apparatus for the exhibition of figures apparently in motion, due to effects of visual persistence. (Thaumatrope, Zoetrope, Zoepraxiscope, Phenakistoscope.)

Entomometer. An entomologic micrometer.

Entoptic. Pertaining to the interior of the eye.

Entoptics. The science of phenomena interior to the eye.

Entoptoscopic. Pertaining to entoptoscopy, *i. e.*, to the autoscopic investigation of phenomena interior to the eye.

Entrance Pupil. The stop, or the image of the stop, which, as seen from the axial point of an object, limits the angular aperture of an optical system for that point.

Entrefer (Fr). Airspace.

Entropion, Entropium. An inversion or turning inward of the ciliary margin of the eyelids.

Entwicklung (G). Development.

Enucleation. Removal of the eyeball.

Epicanthus. A fold of skin passing from nose to eyebrow.

Epidiascope. A microphotographic projection apparatus.

Epiphora. A chronic flow of tears caused by obstruction of the duct.

Epipolic. Pertaining to fluorescence.

Epipolic Dispersion. A phrase applied to the phenomena of fluorescence.

Epipolised. Affected by fluorescence.

Epipolism. Fluorescence.

Episcleritis. Inflammation of the superficial parts of the sclerotica.

Episcope. An optical projection apparatus.

Epoptic Figures. The interference figures seen in idiophanous crystals.

Equation of Achromaticity. An equation expressing the relation which must hold between the radii of curvature

of a compound lens in order that it may be achromatic.

Equation of Light. The correction applied to the observed position of a celestial body in respect of the finite velocity of light.

Equation of the Centre. An astronomical term applied to the excess of the true over the mean anomaly.

Equatorial. An astronomical telescope having its principal axis of rotation parallel to the axis of the earth.

Equerre à reflecteur (Fr). Optical square.

Equiangled, Equiangular, Equangular. Having equal angles.

Equibalance. To counterbalance.

Equiconvex. Having two equally curved convex surfaces.

Equicrescent. Having equal increments; increasing at an equal rate.

Equicrural. Isosceles; having legs of equal length.

Equidifferent. Having equal differences.

Equiform, Equiformal. Having similar forms of equal areas.

Equilateral. Having equal sides.

Equilibration. Equipoise; the maintenance of an even balance.

Equilibrium. The condition of repose under the operation of equal and opposite forces.

Equinoctial Dial, Equatorial Dial. A dial of which the plane is perpendicular to the earth's axis.

Equinumerant. Relating to, or represented by the same number.

Equiparance, Equiparancy. Identity of reciprocal relationship.

Equiparant. Comparable or equiparable.

Equipendent. Evenly balanced; in a state of equipendency or equipoise.

Equiperiodic. Occurring in equal periods.

Equipollence, Equipollency. Equality of force.

Equivalent Focus. The magnifying power of a compound lens referred to that of single lens.

Eradiate. To send forth rays of light.

Eradiation. Emission of rays or waves of light.

Erecting Microscope. A microscope in which the object appears in its natural position, an effect due to the interposition of an erecting prism above the objective.

Erecting Prism. A prism placed between the two lenses of the eyepiece to re-invert the image.

Eriometer. An apparatus for measuring the diameters of minute objects by observing the diameter of coloured rings produced by diffraction.

Ermüdung (G). Weariness.

Erratic. Moving; not fixed; applied to the planets.

Error of Dispersion. The indistinctness produced in the outlines of an image by chromatic aberration.

Erscheinung (G). Phenomenon.

Ersetzen (G). To replace.

Erythrean. Of a red or reddish colour.

Erythrocytometer. An instrument for estimating the number of red blood corpuscles.

Erythroid. Of a ruddy colour.

Erythrophobe. An animal to which red light is objectionable.

Erythrophytoscope, Erythroscope. A kind of optical instrument used in examining light reflected from different bodies.

Erythropsia. Red vision.

Esocataphoria. Has been used to indicate the tendency of the visual line to curve inward and downward.

Esophoria. Tending of the visual lines inward.

Esotropia. Converging strabismus.

Esthesiometer, Æsthesiometer. An instrument resembling a pair of dividers used for the measurement of tactile sensibility.

Etendue (Fr). Amplitude.

Etheric, Etherical. Pertaining to the luminiferous ether.

Etheriform. Analogous to the ether.

Euchlore, Euchloric. Having a distinctly green colour.

Excandescence, Excandescency. A white heat.

Excandescent. White heat.

Exit Pupil. The image of the entrance pupil focused by an optical system.

Exner's Colour-figures. Figures due to homogeneous red, green and blue light falling successively upon the retina.

Exocataphoria. Has been used to denote the tendency of the visual line to curve inward and downward.

Exophoria. Tending of the viusal lines outward.

Exophthalmia. Abnormal prominence of the eyeball.

Exophthalmos. Protrusion of eyeball.

Expansile. Expansible.

Explement. The amount by which an angle is short of four right angles.

Expositionsmesser (G). Speed indicator.

Exposure. In photography: The action of exposing any sensitive surface to the action of light.

Extra-atmospheric. Beyond the atmosphere.

Extra-axial. Outside the axis.

Extramission. Emission, as of radiation.

Extra-ocular. Situated outside the eye.

Extra-orbital. External to the orbit or eye.

Extraordinary Ray. In doubly-refracting crystals the ray the path of which does not follow the law of refraction.

Extrarectus. The outer abducent muscle of the eyeball.

Eye. The organ of sight.

Eye-and-ear Observation. An astronomical observation by the method in which the time is fixed by ear by noting the beat of a clock, while the transit of the star is observed in the telescope.

Eyeglass. Any lens, or combination of lenses, adapted for improving the sight; a pair of lenses resembling spectacles, but mounted in a lighter frame.

Eyelid. The movable covering of the eye.

Eyepiece. In a microscope or telescope, the lens, or combination of lenses, by which the image of an object formed in the focus of the instrument is viewed.

Eyepiece Indicator. A printing device used in connection with an eyepiece for marking any object in the field of view.

Eyepiece Micrometer. An eyepiece connected with a

micrometer for the purpose of measuring the size of the real image of an object.

Eyepoint. The bright circle at the crossing point of the rays above the ocular of a microscope.

Eye-protectors. Very weak convex glasses or glasses of a neutral tint.

F.

Fadenkreuz (G). Cross wires.

Faisceau lumineux (Fr). Pencil of rays.

False Image. An image due to reflection at one or more surfaces in compound lenses.

False Vision. See Pseudoblepsia.

Farbenemphintlich (G). Sensitive to colour.

Farbenscheibe (G). Colour disc.

Farbenzerstreuung (G). Dispersion.

Far-point. The farthest point of distinct vision.

Far-sighted. Hypermetropic or presbyopic.

Fatigue (Fr). Weariness.

Fehlerausgleichung (G). Compensation of errors.

Fente (Fr). Slit.

Fermentation Saccharimeter. An instrument for testing the amount of sugar in urine.

Fernobjectiv (G). Telephotographic lens.

Fernrohr (G). Telescope.

Ferrotype. A photographic positive on a sheet iron support.

Fibre-cross. A fine strand, as of spider's thread, or a pair of parallel or transverse wires or strands, mounted in the focal plane of an optical instrument. (Cross-Hair, Cross-Wire.)

Fibrine. Presenting a fibrous appearance.

Field Glass. A small, portable terrestrial telescope, either monocular or binocular.

Field Lens. In the lens-combination of a microscopic ocular the lens nearest to the objective.

Field of a Lens. The surface approximately passing through the foci of all points within the efficient range of a lens. This surface is in most

instances somewhat curved, but it is preferable that it should be as flat as possible.

Field of Vision. The space or apparent surface within which objects are seen in an optical instrument.

Filar Microscope. A microscope having cross-wires in the focus of the microscope.

Filemot. A yellowish-brown or faded leaf colour.

Finder. (*a*) A supplementary lens for locating the object. (*b*) A microscopic slide divided by crossed lines for the purpose of registering the position of any particular point in the field of view.

Fine Adjustment. The adjustment of an optical instrument by means of a micrometer screw.

Finger Mirror. A dental mirror attached to the finger by a clasp.

Fissile. Susceptible of cleavage.

Fixate. To render, or to become, fixed.

Fixative. Anything serving to fix or mordant.

Fixed Focus. That point on the axis of a lens upon the field passing through which all objects situated beyond a certain minimum distance from the lens are approximately focused.

Fläche (G). Plane.

Flame Gauge. An instrument for measuring the intensity of a flame.

Flare. A blurred or fogged portion on a developed plate, generally due to reflection of light within the camera.

Flatness of Field. The absence of appreciable curvature in the field of a lens.

Flavescent. Becoming yellowish.

Flea-glass. An early form of the simple microscope, with a plano-convex lens.

Flint Glass. A glass made of a composition of lead oxide, sand and alkali.

Florascope. A botanical lens.

Fluctuant. Wavering.

Fluctuate. To waver; unstable; to change irregularly.

Fluid Compass. A magnetic compass in which the weight of the card is partly neutralised by its immersion in a fluid.

Fluid Lens. A hollow lens filled with a refractive fluid.

Fluoresce. To be, or to become, fluorescent.

Fluorescence. The property possessed by some transparent bodies of rendering ultra violet rays visible.

Fluorescent. Produced by, or having the properties of fluorescence.

Fluorescent Eyepiece. A form of eyepiece used in examining the ultra-violet spectrum made visible by fluorescence.

Fluoroscope. A device used in radiography for determining whether x-rays are produced in a Crookes tube, and the degree of their intensity.

Fluor-spar. Native fluoride of calcium.

Flüssigkeitsprisma (G). Liquid prism.

Focale (Fr). Focus.

Focal Distance. The distance from the optical centre of a lens or a mirror to its focus.

Focalebene (G). Focal plane.

Focal Illuminator. The concentration in a darkened room, by means of a convex lens, of the flame of a lamp upon the object to be examined.

Focalise. To concentrate in a focus.

Focal Length. The distance of the principal focus from the centre of a lens or the vortex of a mirror.

Focal Plane. A plane through the focus of a lens perpendicular to its axis.

Focal Points. The two principal foci of a compound dioptric system.

Focimeter. An apparatus for determining the chemical focus of a not properly achromatised lens.

Focus. The point to which a pencil of rays converges or from which it diverges.

Focus Differenz (G). Chemical focus.

Focusing Screen. A contrivance by means of which the photographer adjusts the size and focus of the object to be photographed.

Focusmesser (G). Focimeter.

Focusing Cloth. A cloth thrown over the camera and the head of the photographer when focusing, with the object of excluding any other light than that coming through the lens.

Focusing Frame. The frame which holds the ground glass on which the image is focused.

Focusing-glass. A magnifier used to examine the image upon a focusing-screen.

Foliate. To cover with, or to form, a thin plate or lamina.

Focustiefe (G). Depth of focus.

Folding Camera. A camera which can be folded together and packed into a small space.

Foot-screw. A form of adjusting-screw for levelling purposes.

Foramen of Soemmering. A term applied to the appearance presented by the retina at the yellow spot.

Forced Vibration. Vibration, the period of which is modified by an outside force.

Foot of a Microscope. The part of a microscope by which it rests on the table.

Fortpflanzung (G). Propagation.

Fond (Fr). Background.

Fontana, Spaces of. Small spaces between the fibres of the posterior elastic membrane of the cornea at the outer angle of the anterior chamber, and serving to transmit the aqueous humour from the interior to the exterior of the eye.

Foucauld's Prism. A particular form of polarising prism.

Fourth Nerve. The nerve supplying the superior oblique muscle of the eye. (Thochlear.)

Fovea centralis retinæ. A depressed spot in the macula lutea (yellow spot) where vision is most distinct.

Foyer (Fr). Focus.

Foyers conjugués (Fr). Conjugate foci.

Foyer réel (Fr). Real focus.

Franklin's Glasses. Spectacles with horizontally divided lenses.

Fraunhofer's Lines. A number of dark bands in the solar spectrum, first observed by Fraunhofer.

Fresnel's Lens. A lens consisting of a central plano-convex lens surrounded by rings, all of which have the same focus as the central lens.

Frequency. The number of times any regularly repeated phenomenon occurs in a unit of time.

Frontal Distance. The space between the objective and the cover glass when the object is in focus.

Fugacious. Transitory.

Fulgent. Very bright.

Fulgid. Glittering.

Fulvescent. Approaching a fulvous colour.

Fulvous. Reddish yellow; tawny.

Fundus of the Eye. The posterior surface in the eye, visible by the aid of the ophthalmoscope.

Fuscescent. Approaching to, or tinged with, dark brown.

Fuscous. Of a dark brown colour.

Fuzzy Image. A picture not in focus.

G.

Galactometer. A graduated per cent. tube, or creamometer. (Lactometer, Lactodensimeter.)

Galilean Telescope. A telescope with a concave lens for its eyepiece.

Galvano-thermometer. A thermometer influenced by the heating effect of an electric current.

Gauge. A measuring instrument.

Gauss' Planes. See Principal Planes.

Gegenseitig (G). Reciprocal.

Geissler Tube. Low vacuum tube, employed in demonstrating fluorescence and phosphorescence phenomena.

Gekreuzte prismen (G). Crossed prisms.

Gelatigenous. Yielding gelatine.

Gelatiniform, Gelatinoid. Resembling gelatine.

Geometrical Optics. That branch of optics which concerns itself with the laws of the reflection and refraction of light.

Georama. A large spherical chamber on the interior surface of which a complete

view of the earth's surface is depicted.

Geoscopic Microscope. An instrument for investigating the minute structure of soils.

Geostatics. The statics of rigid bodies.

Geothermometer. An instrument for measuring terrestrial heat in mines, etc.

Gerade Linie (G). Straight line.

Geradlinig (G). Rectilinear.

Geradsicht (G). Direct vision.

Gesetz (G). Law.

Gesichtsachse (G). Optic axis.

Gesichtsempfindungen (G). Phenomena of vision.

Gesichtsfeld (G). Field of view, angle of view.

Gitter (G). Grating.

Glan's Prism. A particular form of polarising prism.

Glass. A vitreous compound of two or more metallic silicates.

Glaucoma. A condition of the eye indicated by increased tension of the ball, due to increase of the contents.

Glaucous. Pale greenish-grey blue.

Glioma. Neoplasm of the retina.

Glitterance. Brightness.

Globe de l'œil (Fr). Eyeball.

Globe Lens. A lens consisting of two achromatic and identical convergent meniscus lenses, so arranged that the outer surfaces form a sphere.

Globe oculaire (Fr). Eyeball.

Globe-tube. A disused term, applied to a lens system having an aperture of nearly ninety degrees.

Globoid, Globose, Globuloid. Approximately globular.

Globosity, Globularity. Sphericity.

Globulet. A minute globulose particle.

Glucometer. An instrument for the estimation of sugar.

Goniometer. An instrument for the measurement of angles. (Angulometer.)

Gradation of Tone. The gradual merging of one tint or colour into another.

Graphoscope. An instrument for magnifying photographs,

etc., with the aid of a single lens.

Grating. A sheet of glass, or a polished metal surface, ruled with equidistant and parallel lines.

Goniostat. A faceting machine.

Gradatim. By degrees; step by step.

Gradienter. A small levelling instrument.

Graduator. A dividing engine.

Graduction. Angular subdivision in degrees, etc.

Graefe's Sign or Symptom. When the upper lid only imperfectly follows the downward movement of the eyeball. (Von Graefe's Sign.)

Granular Conjunctivitis. A gradual progressive change in the conjunctiva of the eyelids, which become vascular, thickened and rough.

Grattage. A method of treating trachoma (granular conjunctivitis).

Gravimeter. An instrument for the measurement of specific density.

Gravimetric, Gravimetrical. Pertaining to measurement by weight; opposed to volumetric.

Gravitation. Pertaining to the force of gravitation; gravitational.

Gravity. Gravitation, usually in the sense restricted to that force which operates between the earth and small objects at its surface.

Gregorian Telescope. The first reflecting telescope made.

Grenzwinkel (G). Critical angle.

Grösse (G). Magnitude.

Grossissement (Fr). Magnification.

Ground Glass. Glass, one or both surfaces of which have been ground with emery or some similar surface.

Growing-cell, Growing-slide. A plane glass box adapted for the preservation of living micro-organisms.

Gun-searcher. An optical appliance for use in examining the bore of a gun.

Gyral, Gyrant. Whirling; rotating.

Gyrational. Characterised by gyration, or a motion of revolution.

Gyroidal. Spiral or gyratory.

H.

Haidinger's Brushes. A phenomenon resulting from the feeble polarising properties of the refracting structures of the eye.

Halbmesser (G). Radius.

Half-prism Spectroscope. A form of spectroscope in which the rays enter the prism at right angles to one of its faces, and are only dispersed when emerging from the opposite face.

Half-shadow Apparatus. A modification of the ordinary polaristrobometer, in which the sensitive part is so constructed that the field of view is divided in two or more surfaces which, the analyser being in a certain position, show a uniform degree of partial shadow.

Half-vision Centre. A centre situated in the apex of the occipital lobe.

Haloed. Surrounded with a halo.

Halation. The photographic action of light reflected within the camera.

Haloscope. An experimental appliance by means of which the phenomena of halos can be exhibited.

Hallotype, Hellenotype. A translucent photographic picture superposed on one similar in outline but stronger or opaque.

Halo. A circle of light around a luminous body due to the refraction of light through vapour.

Hand Camera. A small portable camera.

Hand-glass. A small magnifying glass for increasing the power of sight.

Hauptachse (G). Principal axis.

Hauptstrahl (G). Principal ray.

Haze. A thin mist.

Helix. Applied to a curve becoming a straight line when the surface is unrolled into a plane.

Helligkeit (G). Brightness.

Heliochromic. Photographic.

Heliochromy. Photography in natural colours.

Heliochromoscope. An instrument in which the triple images obtained by the heliochromic process may be viewed as one picture, showing the object in its natural colours.

Heliochromotype. A photograph in natural colours.

Heliochromy. The art of photographing in natural colours.

Heliograph. (*a*) An apparatus for taking sun photographs. (*b*) An instrument for measuring the intensity of sunlight. (*c*) A flashing mirror for sunlight signalling. (See Heliotrope.)

Heliogravure. Photo-engraving; helio-engraving.

Helioid. Resembling the sun.

Heliology. The science of the sun.

Heliometer. A micrometric telescope with bisected object glass.

Heliometric, Heliometrical. Relative to measurement of the sun.

Heliophilous. Attracted by sunlight. (Leucophilous.)

Heliophobia. Fear of the sun's light or heat.

Helioscope. An instrument for the direct ocular examination of the sun.

Heliosis. Subjection to the physiological influence of sunlight.

Heliostat. An apparatus with automatic adjustments for reflecting sunlight in a constant direction; also applied to a porte-luminère.

Heliotrope. A movable mirror, reflecting the light of the sun, used for signalling.

Heliotroper. A man employed to operate heliographic instruments.

Heliotype. A heliotypic picture.

Heliotypy. A photographic printing process resulting in a positive impression from which direct copies may be taken in ink.

Helvolous. Dull reddish-yellow; tawny.

Hemacytometer, or Hæmacytometer. An instrument used in counting the corpuscles of blood.

Hematitic. Of a dull red colour.

Hemeralopia. A condition of seeing well by day but badly at dusk. (Hartridge.)

Hemianopic, Hemiopic. Pertaining to, or affected by, hemiopia.

Hemianopsia. Blindness in half the visual field. (Hemianopia.)

Hemicircle. A semi-circle.

Hemicylindrical. Having the form of half of a cylinder axially divided.

Hemiopia, Hemianopia, Hemianopsia, Hemiablepsia. Loss of vision over one-half the retina, causing a loss of half the visual field.

Hemispheroid. Half of a nearly spherical figure.

Hemispherule. Half of a minute sphere.

Hemitropic, Hemitropous. Half turned round.

Heptagon. A figure enclosed by seven straight lines.

Heptahedron. A solid figure having seven faces.

Heptangular. Having seven angles.

Hernia Iridis. Perforating ulcer in the cornea or ciliary region.

Herpes Frontalis. A disease producing anæsthesia of the cornea with or without ulcers, or ulcers only, which leave behind very large opacities. (Herpes Zoster Ophthalmicus.)

Herchelian Rays of the Spectrum. Invisible, infra red, heat rays.

Herschelian Telescope. A direct front-view reflector.

Hervorrufung (G). Development.

Heterochromia. A difference in colour (in the irides).

Heterologous. Not homologous.

Heteronymous Diplopia. Crossed diplopia.

Heteronymous Images. Double ocular images apparently displaced from one another in the contrary sense to the displacement of the eyes in which they are produced.

Heterophoria. Weakness of external eye muscles causing the visual lines to be other than in parallelism. (Muscular asthenopia.)

Heterophthalmia. A term denoting difference in size, colour or position of the two eyes.

Heteroptics. Perverted uses of the eyes; false vision.

Heterotropia. Manifest squint. (Strabismus.)

Hettocrytosis. A slight curvature.

Hexagon. A figure enclosed by six straight lines.

Hexahedron. A solid figure having six faces.

Hexangular. Having six angles.

High Lights. Those parts of the photographic picture which are brighter than the rest.

High Power Objective. Objectives of high magnifying power and short focal length.

Hintergrund (G). Background.

Hippus. Continuous movements of the pupil independent of light action.

Hohlspiegel (G). Concave mirror.

Holometer. An instrument for measuring angles in any directions; a pantometer.

Holophotal. Reflecting or refracting without perceptible loss.

Holophote. An optical system by which practically all the light from a radiant is projected.

Holophotometer. An instrument for measuring the total light emitted by a radiant in every direction.

Holosteric. Composed of solid matter throughout.

Hollow Prism. A glass device with parallel faces, for making a fluid prism.

Homobaric. Of uniform weight.

Homocentric. Concentric.

Homofocal. Confocal.

Homogenetic, Homogeneous. Having a common origin.

Homologous, Homological, or In Homology. Having the same relative position or proportion.

Homolateral. Being on the same side.

Homolographic. Exhibiting true relative areas.

Homologue. Anything homologous.

Homogeneous Immersion System. A system of lenses in which the layer of air between the cover-glass and the objective is replaced by a liquid whose refractive index is equal to that of the cover-glass and the front lens of the objective.

Homogeneous Light. Light of one wave-length.

Homogeneous Medium. A medium having throughout the same composition and the same density.

Homonymous Diplopia. Diplopia due to convergent squint or paralysis of the external rectus.

Homonymous Images. Double ocular images apparently displaced from one another in the same sense as the displacement of the eyes in which they are produced.

Hood. A device by means of which a camera lens is protected from extraneous light.

Hordeolum. A stye.

Horizon Glass. The half-silvered glass plane of a sextant.

Horizon of a Globe. The horizontal ring in which a terrestrial gobe is usually mounted.

Hornhaut (G.) Cornea.

Horopter. A line in which lie all the points that in any given position of the eyes are seen singly in binocular vision.

Horopteric. Pertaining to a horopter.

Hour-circle. The graduated circle of an equatorial telescope which lies parallel to the earth's equator.

Hour-line. A line on which the shadow of the gnomon falls at a given hour.

Hue. The quality of a colour, distinct from its intensity.

Huygenian Ocular. A negative eyepiece composed of two plano-convex lenses, the convex surfaces of which are turned towards the objective.

Hyaline. The hyaloid membrane of the eye.

Hyalitis. Inflammation of the hyaloid membrane and of the vitreous humor.

Hyaloid. Pertaining to the hyaloid membrane.

Hyaloid Membrane. The capsule of the vitreous humour of the eye.

Hydatoid. Pertaining to the aqueous humour of the eye.

Hydrophthalmia. A congenital disease of the eye due to the thinning and diminishing power of resistance of the cornea.

Hydrophthalmos. Ox-eyed. Enlargement of the eye due to infantile glaucoma. (Buphthalmos, Keratoglobus.)

Hyetometer. A rain gauge.

Hyetometrograph. A self-recording rain gauge.

Hygrodeik. A form of hygrometer.

Hygrograph. A self-recording hygrometer.

Hygrometer. An instrument for determining the humidity of the atmosphere.

Hygrometric Balance. A form of hygroscope.

Hygrophanous. Transparent when moist and opaque when dry, as hydrophane.

Hyperbolic Lens. A lens having the shape of a hyperboloid.

Hyperchromatism. Abnormally intense colouring.

Hyperecophoria. A slight tendency of the visual line of one eye upward and outward, but not sufficient to produce strabismus.

Hyperesophoria. A slight tendency of the visual line of one eye upwards and inwards, not sufficiently pronounced to cause strabismus.

Hypermetrope. A person affected with hypermetropia.

Hypermetropia, Hypermetropy, Hyperopia, Hyperpresbyopia. Longsightedness, due to focusing of light behind the retina through shortness of the eyeball.

Hyperopsia. Extremely acute vision.

Hyperphoria. That form of heterophoria in which one eye tends to turn upwards.

Hyphæmia. A deposit of blood in the anterior chamber of the eye.

Hypophoria. A tendency of the visual line downward.

Hypopyon. A collection of pus in the anterior chamber of the eye.

Hypsometer. A thermometric appliance used in measuring altitudes.

Hypsometry. The art of measuring elevations of the earth's surface.

I.

Ice-blink. A luminous appearance on the horizon due to the reflection of light from a surface of ice.

Iceland Spar. A transparent variety of calcite, used in polarisation prisms.

Iconantidyptic Telescope. Same as Diplantidian Telescope.

Iconic, Iconical. Of the nature of, or pertaining to, a portrait.

Iconograph. A pictorial representation.

Iconometer. A view meter.

Idiophanous. A term applied to certain types of crystals which exhibit axial interference figures without necessitating the use of a polarisation apparatus.

Ignescent. Emitting sparks; scintillating.

Ihering's Line. A line, tangent to the lower margin of the orbit, and passing through the auricular point.

Illis. One who squints.

Illuminable. Capable of being illuminated.

Illuminary. Illuminative.

Illuminated Bodies. Bodies which reflect, but do not emit, light.

Illumination. The act or process of lighting; the state of being lighted.

Illuminator. A lens or mirror for concentrating the light in an optical apparatus.

Image. The optical counterpart of an object, produced either by rays of light being reflected from a mirror, refracted through a lens, or falling on a plane after having passed through a small aperture.

Image confusé (Fr). Flat image.

Image Plane. The plane normal to the axis of an optical system in which the image occurs.

Image Point. The point in the image space of an optical system which corresponds to a given point in the object space.

Image Space. The space in which the projected points of an object occur, whether real or virtual.

Immersion. In microscopy: The act of immersing the objective in oil, water, or some other liquid for the purpose of preventing total reflection.

Immersion Objective. An objective designed to be used with a liquid between its front lens and the cover-glass of the object.

Impingent. Impinging.

Impolarisable. Not subject to polarisation.

Imponderable. Not subject to gravitational attraction.

Incandescence. The emission of light by a body heated to a high temperature. (Candescence.)

Incandescent. Emitting light, when at a high temperature; glowing with heat.

Incanescent. Becoming grey.

Incanous. Hoary; canescent.

Inchoant. Inchoating; beginning.

Inchoate. Incipient; rudimentary.

Inchoation. The act of commencing.

Inchoative. In a state of inception.

Incidence. The direction of a ray of light in relation to the surface on which it impinges.

Incipient. Beginning; entering on existence or appearance.

Incisely. With or by incisions or notches.

Incisure. A slit-like opening; a notch.

Incurrence. Entrance; incursion.

Index-correction. The correction for the graduation or index error of an instrument.

Index Glass. The pivotted reflector of a sextant or similar instrument.

Index of Refraction. The ratio between the sines of the angles of incidence and refraction of a ray of light passing from one medium into another.

Indicateur de vitesse (Fr). Speed indicator.

Indigometer. An instrument for determining the colourific value of indigo.

Indigometry. The art of measuring the colourific value of indigo.

Indotint. A print made by a form of collotype process.

Inequidistant. Not equally distant.

Inequilateral. Having unequal sides.

Inflammation des yeux (Fr). Inflammation of the eyes.

Inflection or Inflexion. A deviation of a ray of light from the straight path, when it passes over the edge of an opaque body or through a ruled screen. (Diffraction.)

Inflexioscope. A device for demonstrating diffraction.

In Focus. So adjusted as to secure a sharp image.

Infra-red. Below red in the spectrum. (Ultra red.)

Insolation. Subjection to the influence of the sun's rays.

Inspection. Ocular examination.

In-sphere. An inscribed sphere.

In-square. An inscribed square.

Instantaneous Lens. Any lens which, when used with a large aperture, gives a sharply defined image.

Instantaneous Photography. The reproduction, by photographic means, of scenes, etc., too rapid to be distinguished by the eye.

Instantaneous Shutter. A mechancal device for rapidly uncovering and covering photographic lenses.

Instruments pour mesures optiques (Fr). Optical measuring instruments.

Insufficiency. The state of being insufficient for any particular purpose; for instance, insufficiency of the ocular muscles.

Integer. A whole number, in contradistinction to a fraction.

Intensation. Elevation to a higher degree of intensity.

Intense. Existing in, or being raised to, a very high degree; for instance: of light; very brilliant.

Intensification. In photography: The increasing of the printing density of a negative.

Intension, Intensiveness. Intensity.

Intensity. The quality, condition, or state of being intense.

Interaction. Mutual or reciprocal action.

Interaxial. Situated between axes.

Interception. The act of intercepting, stopping, or cutting off.

Interfere. To exercise reciprocal action.

Interference Figures. Designs observed in certain crystals when viewed in converging polarised light.

Interference Fringe. A series of coloured bands observed when light is passed through a diffraction grating.

Interference of Light. A phenomenon due to the superposition of light-waves in different phases.

Interference Phenomena. Phenomena due to the simultaneous action in the same space of two or more wave sources, real or virtual.

Interference Refractometer. An instrument making use of interference phenomena for measuring very minute magnitudes.

Interference Spectrum. The spectrum produced by a diffraction grating.

Interferential Refractometer. An instrument used for measuring the index of refraction of gaseous bodies.

Interferometer. An instrument for measuring, by means of interference phenomena, the wave length of monochromatic light.

Interlunar. Pertaining to the moon's monthly period of invisibility.

Internodal. Pertaining to the space between nodal points.

Interobjective Distance. The distance between the two objectives of a binocular optical instrument.

Interocular Distance. The distance between the two eyepieces of a binocular optical instrument.

Interpolate. To calculate, under some hypothesis of law or continuity, any new term of a series from the values of other terms already known.

Intra-ocular. Situated within the eyeball.

Intra-ocular Pressure. The normal tension of the eye.

Intra-orbital. Within the orbit.

Intra-retinal. Situated within the substance of the retina.

Inverted Image. An image,

the position of which is the reverse of that of the object.

Inverted or Chemical Microscope. A microscope in which the object-glass is placed beneath the object and stage.

Invisible Spectrum. Those parts of the spectrum which are due to rays of a refrangibility, greater or less, than the eye can perceive.

Iridavulsion. The total removal of the iris.

Iridectome. A knife used in excising a piece of the iris.

Iridectomy. Excision of part of the iris.

Iridentropium. Inversion of part of the iris.

Iridesemia. Partial or complete absence of the iris.

Iridesce. To exhibit iridescence.

Iridescence. The property of decomposing light into the colours of the spectrum.

Iridescent Vision. A state of vision in which all the objects viewed appear either coloured, or with their outlines surrounded by prismatic colours.

Iridian, Irian. Of, or pertaining to, the iris of the eye.

Iridine. Iridescent; gleaming with a metallic lustre.

Iridisation, Irisation. Conducing or pertaining to the manifestation of iridescent colour.

Iridise. To make iridescent.

Iridochoroitis. Inflammation of the eye and the choroid coat of the eye.

Iridocinesis. Contraction and expansion of the iris.

Iridocyclitis. Inflammation of the iris and the ciliary body of the eye.

Iridodoialysis. Detachment of the iris from the ciliary body. (Coredialysis.)

Iridodonesis. Tremulousness of the iris.

Irido-motor. Subserving motion in the iris.

Iridoncosis. Thickening of the iris.

Iridoplegia. Paralysis of the sphincter of the iris, producing dilatation of the pupil.

Iridotomy. Incision of the iris. (Iritomy.)

Iris. A thin, round, contractible membrane, hanging vertically in the anterior chamber of the eye.

Irisated, Irised. Iridescent.

Iris blende (G). Iris diaphragm.

Iriscope. An instrument for the exhibition of interference colours.

Iris Diaphragm. A number of thin plates of metal fastened to a ring in the lens mount, by means of which the aperture of the lens can be increased or diminished according to the direction in which the ring is turned.

Iris Illuminator. An illuminating device for the microscope, adapted for use with oblique as well as with axial illumination.

Iritis. Inflammation of the tissue of the iris.

Iritomy. Incision into the iris. (Iridotomy.)

Irradiance. Emission of rays of light.

Irradiant. Emitting rays of light.

Irradiate. To radiate into, to penetrate by radiation.

Irradiation. The apparent enlargement of a strongly-illuminated object.

Irradiative. Something illuminating or emitting light.

Isobar. An isobarometric line.

Isobaric, Isobarometric. Indicating equal barometric pressure.

Isobarism. Equality of weight.

Isochasmic. Indicating equality as to the frequency of auroral displays.

Isochromatic. (*a*) Of the same colour. (*b*) Orthochromatic.

Isochroous. Of uniform colour.

Isoclinal, Isoclinic. Of equal inclination.

Isocrymal, Isocryme. An imaginary line connecting localities of equal mean temperatures, determined during the coldest month of the year.

Isodiametric, Isodiametrical. Having equal diameters.

Isogonal, Isogonic. Having equal angles.

Isogoniostat. A device for regulating the movement of the prism train of a spectroscope.

Isomorphism. Similarity of crystalline form.

Isoperimetrical. Having equal boundaries.

Isosceles. Having two equal sides.

Isothere. An imaginary line traversing the earth's surface through regions of the same mean summer temperature.

Isotherm. An imaginary line connecting points on the earth's surface which have the same mean temperatures.

Isotropic. Having the same properties in all directions.

J.

Jacob's Membrane. The layer of rods and cones of the retina of the eye.

Jamin's Circle. A measuring device employed in demonstrating reflection, refraction, and polarisation phenomena.

Jena Glass. Glass of great uniformity of texture, and offering in its various qualities a great variety of refractive and dispersive powers; called after the town where it was first made.

Jumelles (Fr). Double opera glasses.

K.

Kaleidograph. A projecting kaleidoscope.

Kaleidoscope. An instrument in which a number of mirrors are so arranged that objects viewed through it appear repeated in symmetrical patterns. (Caleidophone.)

Kaleidoscopic, Kaleidoscopical. Relating to the kaleidoscope.

Kaleidophone. An instrument by which the composition of vibrations is illustrated with the aid of visual persistence.

Kathetometer. A horizontal telescope, adjustable on a vertical standard, used for the accurate measurement of small differences of level. (Cathetometer.)

Kegelspiegel (G). Conical mirror.

Keil (G). Wedge.

Keplerian Telescope. A form of refracting telescope, having a short-focal convex lens as an eyepiece.

Keratitis. Inflammation of the cornea.

Keratocele. Hernia or protrusion of Descemet's membrane through the cornea.

Keratoconous. An abnormal curvature of the cornea. (Conical Cornea.)

Keratochromatosis. Discoloration of the layers of the cornea.

Kerato-conjunctivitis. Inflammation of the cornea and conjunctiva.

Keratodermatomalacia. Morbid softness of the cornea.

Keratoglobus. Ox - eyed. Bulging of the eye due to infantile glaucoma. (Buphthalmos Hydrophthalmos.)

Keratomalacia. Softening of the corneal tissue.

Keratometer. An instrument for measuring corneal astigmatism.

Keratonyxis. German term for a needling operation for breaking the opaque lens.

Keratoscopy. An inspection of the cornea.

Keratonyxis. An operation for breaking up a soft cataract.

Keratorrhexis. Rupture of the cornea.

Keratoscleritis. Inflammation of the cornea and sclera.

Keratotome. The name given to the various knives used for making incisions in the cornea.

Keratomy. Any incision of the cornea.

Kinematics. The science of motions.

Kinematograph. An apparatus by means of which a series of instantaneous photographs taken in rapid succession can be projected with equal rapidity on a screen in such a manner as to reproduce the original scene.

Kinetic, Kinetical. Causing or involving motion.

Kinetograph. A contrivance for taking a series of pictures of rapidly moving objects in quick succession, for use in the kinetoscope.

Kinetoscope. An instrument for effecting the combination of axes of different radii in one curve. A kind of zoetrope.

Knotenpunkt (G). Nodal point.

Konjugierte Brennpunkte (G). Conjugate foci.

Kopfschirm (G). Reflector.

Korectopia. Displacement of the pupil. (Corectopia.)

Koroscopy. The shadow test for the refraction of the eye.

Kreisbewegung (G). Rotatory motion.

Krümmung (G). Curvature.

Krümmungsmittelpunkt (G). Centre of curvature.

Kryometer. A thermometer adapted for the measurement of very low temperatures.

Künstliches Light (G). Artificial light.

Kurzsichtigkeit (G). Myopia.

Kymograph, Kymographion. An instrument by means of which pulsations of fluid pressure are recorded.

Kymographic. Pertaining to a kymograph.

L.

Lachrymal Duct. The duct that conveys the tears from the lachrymal sac to the nose.

Lachrymal Sac. The dilated upper (blind) portion of the lachyrmal duct.

Lachrymation. Excessive secretion of tears.

Lactobutyrometer. A lactometer graduated for the determination of butter in milk.

Lactodensimeter. An instrument for determining the specific gravity of milk.

Lactometer. A graduated per cent. tube, or creamometer. (Lactodensimeter, Galactometer.)

Lactoscope. An instrument for measuring the opacity of milk.

Ladled Glass. Broken crown-glass intended for re-melting. (Cullet.)

Læotropic, Læotropous. Turning to the left; sinistral.

Lagophthalmia, Lagophthalmos, Lagophthalmus. Inability to close the eyelids.

Lambent. Running along or over a surface, as if in the act of licking; softly bright; gleaming.

Lamellarly. In the form of laminæ.

Lamellar, Laminar, Laminary. Disposed in laminæ.

Lamellate, Lamellated, Lamelliform, Laminiform, Laminose. Consisting of a lamina or laminæ.

Lamelliferous, Laminiferous, Lamellose. Consisting of laminæ.

Lamina. A thin plate or scale.

Laminability. The laminable quality, or capability of being formed into thin plates.

Lamprotype. A photographic print having a bright surface.

Landscape Lens. A photographic lens specially adapted to landscape photography.

Landscape Mirror. A mirror by means of which a condensed image of a landscape is produced.

Lanternoscope. An instrument for viewing lantern slides.

Lantern Slides. Glass transparencies intended for projection by means of a magic lantern.

Lapidification. The process of turning substances into stone; petrifaction.

Laryngoscope. An instrument for examining the larynx and trachea.

Latent. Not manifesting well-marked symptoms.

Latent Image. The invisible image resulting from the action of light on the sensitive photographic plate.

Latent Light. Light to which the eye is insensible.

Lateral. (*a*) Pertaining to a side; (*b*) at right angles to a line of strain or motion.

Lateral Aberration. A term applied to the distance of a ray from the geometrical focus, measured at right angles to the axis.

Lateriflection, Lateroflection. A bending sideways.

Lateritypy. Bilateral symmetry.

Laterofrontal. Situated on the side and towards the front.

Lateromarginal. Situated on the side and edge.

Lateroversion. A turning to one side.

Latescent. Becoming latent or obscure.

Law of Absorption. The law that the proportion of transmitted radiation varies geometrically as the thickness of the absorbing medium varies.

Laws of Reflection. (*a*) The angles of reflection and incidence are equal. (*b*) The reflected and incident ray are

in the same plane with the normal to the surface at the point of incidence.

Law of Refraction. The law stating that the ratio of the sines of the angles of incidence and refraction are constant for the same media.

Least Circle of Aberration. The smallest circle in which an object-point is imaged.

Leistungsfähigkeit (G). Capacity, efficiency.

Le lieu aveugle (Fr). The blind spot.

Lens. A transparent substance, usually glass, bounded either by two curved surfaces or by a curved surface and a plane.

Lens-cap. A covering for the opening of the tube into which a lens is fitted.

Lens-holder. A support for a lens, or a lens-system, occasionally used for adjusting an object to the focus.

Lenticular, Lentiform, Lentoid. Having the form of a double-convex lens.

Lenticular Astigmatism. Astigmatism due to causes arising from the crystalline lens.

Lenticular Stereoscope. A stereoscope wherein the superposition of views respectively adapted to the right and left eye is effected by means of lenticular prisms or of prisms and lenses.

Lenticularly. In the manner of a lens.

Lentille (Fr). Lens.

Leuchtender Körper (G). Luminous body.

Leuchtkraft (G). Intensity.

Leucoma. A very large and dense white spot or opacity on the cornea.

Leucopathy. Albinism.

Leucophilous. Attracted by sunlight. (Heliophilous.)

Leucoscope. An appliance for the estimation of colour-blindness.

Leucous. Light-coloured, albinotic.

Levator-palpebræ. The muscle raising the upper eyelid.

Levogyrate, or Lævogyrate, Levogyrous, Levorotatory. Converse of dextrogyrate.

Lichtbildkunst (G). Photography.

Lichtbrechungsapparat (G). Refraction apparatus.

Lichtbrechungsvermögen (G). Refrangibility.

Lichthof (G). Halo, halation.

Lichtkraft (G). Rapidity.

Lichtmesser (G). Photometer.

Lichtquelle (G). Source of light.

Lichtstrahl (G). Ray.

Lichtvertheilung (G). Distribution of light.

Lieberkuhn. A concave annular speculum for use in microscopy.

Light. The etherial disturbance which, acting upon the organs of sight, renders visible the objects from which it proceeds.

Light-ball. A quick-burning compound employed for purposes of temporary illumination.

Light-elasticity. That elasticity of the luminiferous ether upon which the propagation of light-undulations depends.

Light-excluding Appliance. A device for excluding light from an optical instrument.

Light-filter. A device transparent to rays of certain wave-lengths, but opaque to others.

Light-moderator. A compound colour-screen used in microscopy.

Light-reflex. A narrow oval ring of light observed on the retina by means of the ophthalmoscope.

Light-struck. Fogged (photographically).

Light-source. Any object from which light proceeds.

Light-vector. A line indicating the direction and intensity of a ray of light.

Light-wave. Etherial undulations to whose action on the eye the sense of sight is due.

Ligne droite (Fr). Straight line.

Lilaceous. Of a lilac colour.

Limb. The edge of a graduated circle.

Limit-gauge. A gauge used to ensure that pieces do not exceed, or fall below, a certain specified range of dimensions.

Linear-oblong. Oblong and very narrow.

Lineate, Lineated. Marked with longitudinal and parallel lines.

Lineiform. Linear.

Linelet, Lineolet. A very short line.

Linen-prover. A small microscope for determining the coarseness of texture in linen.

Line of Accommodation. That portion of the visual line in which objects are seen without any perceptible indistinctness and with a given degree of accommodation.

Line of Fixation. An imaginary line, drawn from the object, viewed through the centre of rotation of the eye.

Line of Sight. The line joining the object looked at and the eye of the observer.

Linse (G). Lens.

Linsenförmig (G). Lenticular.

Line Spectrum. The spectrum of an incandescent vapour, consisting of separate narrow lines.

Liquid Prism. See Watery Prism.

Lissajous Curves. Figures produced by the composition of two simple harmonic motions.

Lithochromatographic. Chromolithographic.

Lithology. The microscopic study of rocks.

Lithophosphor. A stone which becomes phosphorescent when heated.

Lithophotography. Photolithography.

L'oeil (Fr). The eye.

Logarithm. The index of that root of a number which is equal to a constant forming the base of the system of logarithms.

Logarithmetic, Logarithmetical, Logarithmical. Pertaining to logarithms; logarithmic.

Logarithmotechny. The art of calculating logarithms.

Log-glass. A small magnifying glass for increasing the power of sight. (Hand-glass.)

Logistic Logarithm. The logarithm of any given number of seconds subtracted from that of 3,600.

Loi (Fr). Law.

Longeur de foyer (Fr). Focal length.

Longilateral. Having the form of an elongated parallelogram.

Longimetric. Pertaining to measurement along a line.

Longimetry. The art of measuring lengths.

Longisection. Longitudinal section.

Long-sighted. Hypermetropic or presbyopic.

Longitudinal. Running lengthwise.

Longitudinal Aberration. A term applied to the distance of a ray from the geometrical focus, measured along the axis.

Looming. A form of mirage.

Lorgnette. An opera-glass.

Lorgnon. An eyeglass, or a pair of eyeglasses, capable of being shut into a frame, which serves as a handle.

Loupe (Fr). Magnifying glass.

Loupe redressante (Fr). Erecting eyepiece.

Low-power Objective. Objectives of low magnifying power and long focal length.

Loxocosm. An appliance to demonstrate the effects of the obliquity of the earth's axis in determining the length of the day.

Lucency. Brightness; lustre.

Lucent. Shining; lustrous.

Lucernal. Relating to a lamp or other artificial light.

Lucernal Microscope. A microscope in connection with which a lamp is employed as the source of illumination.

Lucid. Transparent.

Lucida. A star visible to the unaided eye.

Lucific. Producing light.

Luciform. Of the nature of or resembling light.

Luciferous. Giving light.

Lucifugous. Shunning light.

Lucigen. A lamp of great illuminating power.

Lucimeter. (1) A photometer; (2) a sunshine recorder in the form of an evaporometer.

Luculent. Luminous; transparent.

Luftschicht (G). Airspace.

Luminant. (1) Emitting light; (2) a radiant of light.

Luminiferous. Yielding light, or serving as a medium for the conveyance of light.

Luminiferous Ether. A hypothetical medium filling all space through which the vibrations of light, radiant heat, and electric action are propagated.

Lumine. The luminiferous ether.

Luminescence. The state of a body wherein it emits light without having been rendered incandescent.

Lumière blanche (Fr). White light.

Lumière diffuse (Fr). Diffused light.

Luminosity. The intensity of light in a colour, photometrically measured.

Luminous. Radiating or reflecting light.

Lunarian, Lunarist. A student of lunar phenomena.

Lunarium. A mechanical representation of the moon and its phases.

Lunate, Lunated, Luniform. Crescent-shaped.

Lunatellus. An orrery showing the relative motions of the earth and moon.

Lunately. In the form of a crescent.

Lunation. The period from one new moon to the next.

Lunette. A concavo-convex spectacle lens.

Lunette (Fr). Telescope.

Lunettes (Fr). Spectacles.

Lunisolar. Depending upon the moon and the sun jointly.

Lunula, Lunule, Lunulet. A small crescent-shaped object.

Lunular, Lunulate, Lunulated. Narrowly crescented.

Lupe (G). Magnifying glass.

Lutescent. Yellow-tinged, or becoming luteous.

Luteolous. Yellowish; faintly luteous.

Luteous. (*a*) Of a saffron or reddish-yellow colour. (*b*) Like mud or clay.

Lychnidiate. Phosphorescent, as is a glowworm.

M.

Macrodiagonal. The longer diagonal of a rhombic prism.

Macrometer. A surveying instrument for measuring inaccessible heights or objects.

Macrophotography. The production of an enlargement of a negative in the solar camera.

Macropsia. A pathological condition of the eye in which objects appear enlarged. (Megalopsia.)

Macroscian. Casting a long shadow.

Macroscopic, Macroscopical. Perceptible without the assistance of a magnifying glass; megascopic.

Macrotome. An instrument for cutting thick sections.

Macula lutea. The yellow spot in the centre of the retina, where vision is most perfect. (Yellow Spot of Soemmering.)

Magazine Camera. A small camera, arranged to hold a number of plates.

Magic Lantern. A device for throwing pictures in a darkened room on to a screen.

Magnesium Lamp. A contrivance used for burning magnesium ribbon.

Magnetisation of Light. The rotation of the plane of polarisation of light in a magnetic field.

Magnetism. A condition of vortical motion in the luminiferous ether.

Magnifying Glass. A convex lens, so called because the apparent dimensions of objects viewed through it are increased.

Magnifying Lens. A lens which magnifies the apparent size of the object viewed.

Magnifying Power. The ratio of the linear dimension of an image to the corresponding dimension of the object.

Marginal. Situated on, or close to, the margin.

Marginal Definition. The sharpness of the image towards the edges.

Marginal Rays. The limiting rays of a pencil of light.

Marine Glass. See Nightglass.

Marinorama. A panoramic seascape.

Maroon. A very dark crimson-red.

Matrize (G). Negative.

Mattscheibe (G). Focusing screen.

Maxwell's Colour Disc. A colour top with adjustable sectors.

Medium. Any substance through which action is transmitted to a distance.

Megalograph. A form of camera lucida used with the microscope or kaleidoscope.

Megalopsia. A pathological condition of the eye in which

objects appear enlarged. (Macropsia.)

Megascope. An optical instrument for projecting enlarged images of solid objects.

Megascopic, Megascopical. Macroscopic.

Megasopically. Macroscopically.

Megatype. An enlarged photograph.

Meibomian Cyst. A cyst of the eyelid. (Chalazion.)

Meibomian Glands. Glands situated on the inner surface of the eyelids, between the tarsal cartilages and the conjunctiva.

Melanin. The black pigment of the eye.

Melanoscope. A form of compound colour screen.

Melanosity. Tendency towards blackness or darkness of colour.

Melanotype. A ferrotype.

Membrane of Descemet or Demours. A thin, elastic, transparent membrane, forming the posterior layer of the cornea. Also called posterior elastic lumina.

Meniscal. Pertaining to, or having the form of, a meniscus.

Menisciform. Of a crescent shape.

Meniscoid, Meniscoidal. Like a meniscus.

Meniscus. A convexo-concave lens, the radius of curvature of the concave face being less than that of the convex.

Meridian Circle. An astronomical telescope adjustable in the plane of the meridian. (Transit Circle.)

Meridian Marks. Marks by the aid of which a transit instrument is set in the meridian.

Meridionality. The state of being on the meridian.

Mesologarithm. A logarithm of the cosine or cotangent.

Messinstrument (G). Measuring instrument.

Metachrosis. Power of changing colour at will.

Metamorphic. Producing or exhibiting change of structure.

Metamorphopsia. A pathological condition of the eye in which objects appear elongated, irregular, or confused.

Metamorphoscope. An optical toy for producing pictorial transformations.

Meteogram. A diagram bearing tracings made by several meteorological instruments.

Meteograph, Meteorograph. An appliance in which the self-registering portions of several meteorological instruments are adapted to impress their records on one sheet.

Meteorographic. Pertaining to meteorography.

Meteorography. The registration of meteorological phenomena.

Meteorological Curve. A line representing graphically the successive actual or mean values of any meteorological element.

Meteorological Elements. The fundamental data of meteorological observations.

Meteorology. The science which treats of the motions and phenomena of the earth's atmosphere.

Meter-angle. The angle of the visual axis, for one meter distance.

Metrochrome. An instrument for the measurement of colours.

Mica Spectacles. Spectacles made of mica, used as eye protectors.

Microactinic. Pertaining to the operation of actinism; short in duration or feeble in intensity.

Microblephary. Unusual smallness of the eyelids.

Microcrystalline. Minutely crystalline.

Micrography, Micrology. The description of objects too small to be discerned by the naked eye.

Microphotograph. A microscopic photograph of a macroscopic object.

Microphotography. The art of producing microscopic photographs of any object.

Microphthalmia. Morbid smallness of the eye. (Microphthalmos.)

Micropsia. A pathological condition of the eyes in which objects appear abnormally small.

Micrometer. An instrument for measuring microscopical objects, or very small distances.

Micrometer Ocular. An ocular which is connected with a micrometer for the purpose of measuring the real image.

Micrometer-screw. A screw of fine pitch with a large graduated head.

Micrometric, Micrometrical. Pertaining to the micrometer.

Micrometry. The art of minute measurement.

Microscope. An optical instrument for rendering visible small objects which cannot be seen by the naked eye, or for increasing the apparent size of small visible objects.

Microscope à préparer (Fr). Dissecting microscope.

Microscope-lamp. A lamp adapted for use in microscopy.

Microscopic. Pertaining to, or characteristic of, the microscope; of minute size.

Microscopica. Microscopic animals.

Microscopist. One skilled in the use of the microscope.

Microscopy. The art of using the microscope.

Microsection. An exceedingly thin and more or less transparent section of some substance.

Microspectroscope. A combined microscope and spectroscope.

Microstat. The stage and finder of a microscope.

Microstructure. Microscopic structure.

Microtome. An instrument for cutting microsections.

Microtomic, Microtomical. Relating to the use of the microtome or to microtomy.

Microtomist. One who is expert in the use of the microtome.

Microtomy. The art of preparing very fine sections for microscopic examination.

Midangle. Half of a right angle.

Mid-angle Lens. A lens whose focus is intermediate between that of a wide-angle lens and a long focus one.

Mikrometerschraube (G). Micrometer screw.

Mikroskoptisch (G). Microscope stage.

Milieu (Fr). Medium.

Milk-tester. A lactometer.

Mineral Holder. A device,

used in microscopy, for holding minerals.

Minimum-sensible. The smallest or weakest impression which can be perceived by a given sense.

Minimum Thermometer. A thermometer which can be set to record the lowest temperature to which it is exposed.

Minimum Visible. The faintest light, or the smallest angular magnitude, perceptible by the eye.

Mirage. An optical illusion due to atmospheric refraction.

Miroir Concave (Fr). Concave mirror.

Mirror. A polished surface of metal, or of glass, the back of which is covered with mercury or some other reflecting surface.

Mirror-galvanometer. A galvanometer of which the index is a beam of light reflected from a mirror attached to the needle.

Misadjust. To adjust imperfectly or put out of adjustment.

Mise au point (Fr). Focusing.

Mittelpunkt (G). Centre.

Moist Chamber. An airtight chamber for the preservation and microscopic examination of objects in a moist state.

Molarimeter. A thermometer arranged for determining the temperature of meal as it issues from the mill-spout.

Momentaufnahme (G.) Instantaneous exposure.

Monaxial, Monaxonic, Monoaxal. Having but one axis; uniaxial.

Moniconostereoscopic Glasses. Optical glasses giving a stereoscopic effect to single pictures.

Monoblepsia, Monoblepsis. A condition in which the vision is confused when both eyes are used, but normal when only one eye is used.

Monochroic, Monochromical. Having but one colour.

Monochromatic. Of one colour (usually applied to light, indicating that it is of a single definite wave-length).

Monochromatic Lamp. A lamp emitting rays of only one wave-length.

Monochrome. Painting, or a painting, in shades of one colour.

Monocle. A single eyeglass.

Monoclinal. Dipping in one direction.

Monocular Camera. A camera with only one lens.

Monocularly. By means of one eye.

Monocular Microscope. A microscope with only one eyepiece.

Monocular Vision. Seeing with one eye only.

Monoculate, Monoculous. Having only one eye.

Monostereoscope. An instrument producing stereoscopic effects by means of a single lens.

Monotype. A print from a metal plate on which a picture is laid in wet colour.

Moon-blink. A temporary evening blindness said to be occasioned by sleeping in the moonshine in tropical climates.

Morgagni's-humour. The outermost layers of the anterior face of the crystalline lens.

Morgagni's-spheres. Round glassy masses seen in cataractous lenses.

Morphometry. The art of measuring or ascertaining the external forms of objects.

Motion-distortion. Modification of the spectrum due to the motion or motions of the source of light.

Motion-indicator. A combined revolution counter and chronoscope.

Motor Oculi Nerves (Motores oculi). The third pair of cranial nerves, distributed to all the muscles of the eye, except the superior oblique and external rectus.

Mouth-glass. A hand-mirror used by dentists.

Mouvement circulaire (Fr). Rotary movement.

Mucocele. A bulging of the lachrymal sac from excessive secretion of mucus.

Multangular, Multiangular. Having many angles.

Multangularly. In multangular form.

Multangularness. The character of being polygonal.

Multeity. Extreme numerousness.

Multiaxial. Having several or many axes.

Multicolour, Multicolourous. Of many colours.

Multilaminate. Having many layers or laminæ.

Multilateral. Many sided.

Multi-lens Objective. An objective comprising a large number of lenses.

Multilineal, Multilinear. Having many lines.

Multiple Images. Images due to repeated reflection in two or more mirrors.

Multiplying Camera. A photographic camera fitted with a number of lenses.

Multiplying Glass, Multiplying Lens. A facetted lens.

Multirotation. A phenomenon presented by a number of optically active substances according to which the rotating power of a freshly-prepared solution is about twice as great as the final constant rotation.

Mural Circle. A graduated circle fixed in the plane of the meridian and used, in connection with an astronomical telescope, for measuring the declinations of celestial bodies.

Mural Quadrant. A graduated quadrant used as the mural circle.

Muscæ Volitantes. Microscopic vitreous opacities found floating in the vitreous without interfering with the sight.

Mydriasis. Abnormal dilatation of the pupil of the eye.

Mydriatic. (*a*) Pertaining to or causing mydriasis. (*b*) A drug which induces mydriasis.

Mydriasis Spectacles. Spectacles which have, in place of lenses, discs whose centres are pierced by small holes.

Myodesopsia. Subjective visual sensations as of muscæ volitantes.

Myope, Myops. A shortsighted person.

Myopia. Short or nearsightedness caused by focusing of light in front of the retina through abnormal length of eyeball; antithetic to hypermetropia.

Myopic. Affected with myopia; brachymetropic.

Myoporthosis. The correction of myopia.

Myopresbyte. Shortsighted and presbyopic.

Myopsid. Having the cornea of the eye closed; opposed to oigopsid.

Myopsis. A condition of the eyes in which black specks are seen passing before them.

Myoscope. An instrument for the observation of muscular contractions.

Myosis, Miosis. Abnormal contraction of the pupil of the eye, due to paralysis of the iris.

Myositic, Myotic. (*a*) Pertaining to or causing myosis. (*b*) A drug which induces myosis.

Myriorama. A series of interchangeable pieces bearing partial pictures, which can be arranged all together in different ways to form a variety of harmonious designs or landscape views.

Myrioscope. (*a*) A form of kaleidoscope in which the object examined consists of a portion of a length of embroidered work which traverses the bottom of the box. (*b*) A large kaleidoscope for exhibiting carpet patterns.

N.

Nacarat. A light red or scarlet colour.

Näherung (G). Convergence.

Nature-print. A pictorial impression obtained directly from a natural object.

Nauscopic. Serving for nautical telescopy.

Nauscopy. The art of sighting ships at a great distance.

Near-point. The nearest point the eye can bring to a focus.

Near-sighted. Short-sighted, myopic.

Near-sightedness. The state of being near-sighted, myopia.

Nebenachse (G). Secondary axis.

Nebenapparate (G). Accessories.

Nebula. Opacity of the cornea.

Neigung (G). Inclination.

Negative. A photographed image in which the natural lights and shades are reversed.

Negative-bath. A dipping bath used for sensitisation in the wet collodion process.

Negative Crystals. Uniaxial crystals in which the index of refraction of the ordinary ray is greater than that of the extraordinary ray.

Negative Eyepiece. A combination of lenses which intercepts the rays from the objective before they come to a focus.

Negative Image. The complementary image or visual sensation which results from stimulation by white light following colour-selective retinal fatigue.

Negative Lens. Any lens thinner in the middle than on the edges.

Negative Ocular. An ocular in which the real image is formed between the two lens systems of the ocular.

Negative Paper. Paper prepared for the reception of negative proofs.

Negative Picture. The image of an object developed and fixed on a film.

Neomenia. The time of the new moon.

Nemonoscope. An instrument for viewing photographs.

Nephela. A white spot on the cornea.

Nepheloid. Cloudy; turbid.

Neorama. A panorama representing the interior of a large building within which, apparently, the spectator is placed.

Nephelometer. An instrument for measuring the cloudiness of the sky.

Nepheloscope. A piece of apparatus for illustrating the formation of cloud.

Nephoscope. An instrument for investigating the motions of clouds.

Nettetè (Fr). Sharpness.

Netzhaut (G). Retina.

Neuritis. Inflammation of the papilla. (Papillitis.)

Neuro-retinitis. Inflammation of the retina as well as the optic nerve. (Papillo-retinitis.)

Neutralize. To render inoperative, nullify, counterbalance.

Newtonian Telescope. A front view reflector, in which the rays are deflected to the eyepiece by a flat mirror placed at an angle of 45° to the optical axis.

Newtonian Theory of Light. See Corpuscular Theory.

Newtonic Rays. The visible rays of the spectrum.

Newton's Colour Disc. A disc painted with coloured

sectors, used to demonstrate the composition of white light.

Newton's Rings. The rays produced by the interference of light reflected from the opposite sides of a thin film in which the foci of equal thicknesses are circles.

Nicol Prism. A calcite prism so formed that the ordinarily refracted ray suffers total reflection out of the field of view.

Nictation, Nictitation. Repeated rapid opening and closing of the eyelids.

Night-blindness. See Hemeralopia.

Night-eyed. Sharp-eyed, nyctalopic.

Night-glass. A binocular telescope of high light collecting and small magnifying power, principally used in the navy.

Night-sight. Same as day-blindness.

Nigrescent, Nigricant. Blackish; dusky.

Nigrification. The act of making black.

Nigrities. Dark pigmentation.

Nigritude. Blackness.

Niphablepsia, Niphotyphlosis. Snow blindness.

Nitency. Brightness; lustre.

Nitid. Lustrous; shining.

Noctidial. Comprising a day and a night.

Noctilucent, Noctilucid, Noctilucous. Shining by night or in the dark.

Noctilucin. The light emittent substance in phosphorescent animals.

Nocturne. A painting or photograph presenting the characteristic effects of night-light.

Nodal Planes. See Principal Planes.

Nodal Points. Two points so situated on the optical axis of a dioptric system that every ray directed towards one of them is represented after refraction by a ray emanating from the other.

Node. An absolutely or relatively stationary point or line in any vibrant substance.

Nodical. Of, or pertaining to, nodes.

Nodal. Pertaining to nodes or a node.

Nonagon. A figure of nine sides and angles.

Non-actinic Media. Media for the transmission of non-actinic rays.

Non-actinic Rays. Rays that are photo-chemically inactive.

Non-coincidence. A lens-defect to which it is due that the optical and chemical foci fail to coincide.

Nonius. A subsidiary scale, adjustable longitudinally, with reference to a fixed scale, of which the graduation differs somewhat from that of the first. (Vernier.)

Non-recurrent, Non-recurring. Not turning back or occurring again.

Noon-mark. A point which is indicated by the projection of the sun's rays at noon.

Normal. (*a*) A straight line so drawn from a surface that it is perpendicular to the tangent-plane at the point of contact. (*b*) Constituting a standard.

Normalcy, Normality. The state or fact of being normal.

Normalise. To reduce or make conformable to a standard.

Normal Spectrum. A spectrum due to diffraction.

Norremberg Doubler. A form of polariscope in which the polarised ray twice traverses the object under examination.

Nose-piece. The nozzle, or one of the nozzles, of a microscopic tube.

Nuance. A slight variation or delicate shade of difference.

Nubecula. A speck or cloud in the eye.

Nubigenous. Produced by clouds.

Nubilous. Cloudy.

Numerical Aperture. The product of the sine of half the apical angle of the maximum cone of light, which a microscope objective can take up from an axial point of an object, and the refractive index of the medium in which the object is immersed.

Nychthemeron. The natural day of twenty-four hours.

Nyctalopia. Nyctalopiasis. Day-blindness, a form of visual affection in which the vision is distinct only at night, or in a dim light.

Nyctalopic. Affected with day-blindness.

Nyctalops. One who is nyctalopic.

Nystagmus. A condition characterised by involuntary lateral, sometimes rotary, or more rarely vertical oscillations of the eyeballs.

O.

Obconic, Obconical. Conical inversely, *i. e.*, with the apex downward.

Obdeltoid. Triangular with the apex downward.

Obduce, Obduct. To draw over.

Object-finder. A device used in connection with the mechanical stage to mark position in the field of view of a microscope.

Object-glass. That lens, or combination of lenses by which the image-forming rays are first received in any optical instrument.

Objectif à grand angle (Fr). Wide-angle lens.

Objectiv-deckel (G). Cap of the lens.

Objectivsatz (G). Combination set.

Objective. The combination of lenses which forms the object-glass of any optical instrument, but more especially of a microscope.

Objective Symptoms. Those observed by the diagnoser.

Object Plane. The plane normal to the axis of an optical system in which the object occur.

Object Point. Any point considered as an object for an optical system.

Object Space. The space in which the points of a projected object occur.

Oblate. Flattened at the poles.

Obliquation. A turning to one side.

Oblique Illumination. (*a*) In microscopy: Illumination at an angle to the axis of the microscope. (*b*) A form of focal illumination employed in examining the condition of the structures of the anterior half of the eyeball.

Oblique Ray. A ray, the angle of incidence of which is less than 90°.

Obliqui (muscles). The two

oblique muscles attached to the outer side of the eyeball, and rather behind its centre.

Obnubilate. To obscure or darken.

Obscure Radiation. Radiation of waves too long or too short to affect the eye.

Obscure Rays. The invisible heat rays.

Observation par miroir (Fr). Mirror observation.

Obturateur (Fr). Shutter.

Obturateur à rouleaux (Fr). Time and instantaneous shutter.

Obtuse-angular, Obtusangular. Having an obtuse angle or angles.

Obverse. Turned towards or facing.

Obversely. In an obverse form or manner.

Obvert. To turn towards.

Occecation. Becoming blind; blindness.

Occlude. To absorb.

Occulting Eyepiece. An eyepiece by means of which the field of view can be limited as desired.

Ocherous, Ochery, Ochraceous, Ochreous, Ochrey, Ochroid, Ochrous, Ochry. Of a brownish yellow colour.

Ochroleucous. Of a yellowish-white colour.

Octagon, Octangle. A figure of eight sides and angles.

Octahedral, Octohedral. Having eight equal surfaces or faces.

Octahedron, Octohedron. A solid bounded by eight faces.

Octangular. Having eight angles.

Octant. (*a*) The eighth part of a circle. (*b*) An instrument on the principle of the sextant, having a graduated arc of 45°.

Octaval, Octonal, Octonary. Of, or pertaining to, series of eight.

Octolateral. Having eight sides.

Ocular. (*a*) Of, pertaining to, or depending on, the eye; visual. (*b*) An eye-piece of any optical instrument.

Ocularly. By means of sight.

Ocular Micrometer. A micrometer placed in the ocular of a microscope.

Ocular Spectrum. An after image.

Oculist. A person principally

engaged in the study and the treatment of diseases of the eye.

Oculomotor Nerves. The third pair of cranial nerves, distributed to all the muscles of the eye except the superior oblique and external rectus. (Motores oculi.)

Oculomuscularis. Connected with the muscles of the eye.

Oculopupillary. Pertaining to the pupil of the eye.

Oculus Dexter. The right eye.

Oculus Sinister. The left eye.

Odometer. An instrument for measuring distances by counting the revolutions of a wheel. (Trechometer, Trochometer.)

Oeffnung des Objectivs (G). Lens aperture.

Oeffnungswinkel (G). Angle of aperture.

Oesophagoscope. An instrument for inspecting the interior of the gullet by reflected light.

Oigopsid. Having the cornea of the eye open; opposed to myopsid.

Onde, ondulation (Fr). Wave.

Onymatic. Pertaining to the technical nomenclature of a science.

Opacate. To darken or obscure.

Opacity. The quality of a body or substance of being impervious to light.

Opacous. Opaque.

Opalesce. To exhibit opalescence.

Opaloid. Semi-translucent.

Opaque Colours. Colours which reflect, but do not transmit, light.

Opaque Screen. A screen used in connection with magic lanterns.

Opaque Stop. A small V-shaped blackened stop placed in the lens-tube in front of the diaphragm.

Opeidoscope. An instrument for illustrating sound by means of light.

Opening of the Lens Aperture. The diameter of the lens and the diaphragm.

Opera Glass. A short binocular telescope with concave lenses of low power.

Opera-glass Stereoscope. A double opera glass.

Ophthalmatrophia. Atrophy of the eye-ball.

Ophthalmia, Ophthalmitis. Catarrhal inflammation of the eye exhibiting various forms.

Ophthalmia neonatorum. Ophthalmia in a newly-born child.

Ophthalmic. Of, or pertaining to, the eye; ocular.

Ophthalmôbrachytes. Shortening of the axis of the eye.

Ophthalmocroites. The black pigment of the eye.

Ophthalmodesmoxerosis. Excessive dryness of the conjunctiva.

Ophthalmodiastimeter. An instrument for adjusting the axes of lenses to coincidence with the axes of the eyes.

Ophthalmodynia. Rheumatic pain in the eye.

Ophthalmography. A description of the eye.

Ophthalmologic, Ophthalmological. Pertaining to ophthalmology or the scientific study of the eye.

Ophthalmologist, Ophthalmotologist, Ophthalmist. One who is versed in ophthalmology.

Ophthalmology, Ophthalmotology. That branch of science dealing with the anatomy, physiology, pathology, etc., of the eye.

Ophthalmometer. (*a*) An instrument for measuring the capacity of the chambers of the eye. (*b*) An instrument for determining the refraction of an eye. (*c*) An instrument for determining the radius of curvature of the cornea.

Ophthalmoncus. Swelling of the eye.

Ophthalmonosology. The pathology of the eye.

Ophthalmoplegia. Paralysis of one or more of the muscles of the eye.

Ophthalmoplegia externa. Paralysis of all the external muscles of the eye.

Ophthalmoplegia interna. Paralysis of the nerves supplying the iris and ciliary muscle.

Ophthalmoprosepsis. The accommodating power of the eye for both near and distant vision.

Ophthalmotopsis. Prolapse of the eye-ball.

Ophthalmorrhexis. Rupture of the eye-ball.

Ophthalmoscope. An instrument for examining the interior of the eye.

Ophthalmoscopic, Ophthalmoscopical. Of, or pertaining to, the ophthalmoscope or its use.

Ophthalmoscopist. One versed in the use of the ophthalmoscope.

Ophthalmostat. An instrument for fixing the eye and controlling its movements during examination.

Ophthalmostatometry. The process of determining the position of the eyes in the orbits.

Ophthalmostatometer. An instrument for determining the exact position of the eyes in the orbits.

Ophthalmotonometer. An instrument for measuring the tension of the eyeball.

Ophthalmotropometry. The measurement of movements of the eyeball.

Ophthalmula. A cicatrix of the eye.

Opsiometer, Optimeter, Optometer. An instrument for measuring the refractive power of the eye.

Optacin. The visual axis.

Optic. Relating to vision or sight; relating to the eye.

Optic Angle. The angle formed by lines running from the extremities of any object to the posterior nodal point of the eye.

Optic Axis. In a doubly refracting crystal that direction in which no double refraction occurs.

Optic Chiasma. The crossing of the fibers of the optic nerves at the base of the brain.

Optic Disc. The oval spot on the retina formed by the entrance of the optic nerve; known also as the blind spot.

Optic Ganglion. A small quadrangular ganglion situated between the optic nerve and the external rectus muscle.

Optic Hyperæsthesia. Morbidly developed sensitiveness of the eye.

Optic Nerve. The nerve proceeding from the brain, which terminates in the expansion called the retina. (Second Nerve.)

Optic Neuritis. Inflammation of any part of the optic nerve. Sometimes called Papillitis.

Optical. Of, or pertaining to, vision or sight; of, or pertaining to, the eye.

Optical Axis. In an optical system the common normal to the surfaces.

Optical Axis of the Eye. An imaginary line drawn from the centre of the cornea to a point midway between the macula lutea and the optic disc.

Optical Centre of a Lens. The point through which incident rays pass without change of direction.

Optical Circle. A graduated circle by means of which the laws of refraction are demonstrated.

Optical Constants. Numbers which are the numerical expression of optical properties.

Optical Densimeter. An instrument for determining the optical density, *i.e.*, the refractiveness of substances.

Optical Density. The power possessed by a medium of retarding the rate of transmission of light.

Optical Glass. Glass adapted for optical purposes.

Optical Instrument. An instrument, the operation of which is dependent on light.

Optical Interval. In the case of a double positive lens system the distance between the second principal focus of one lens system and the first principal focus of the other on the same axis. In the case of the microscope it is called the optical tube length.

Optically. By optical means.

Optical Meteorology. The science of the luminous phenomena of the atmosphere.

Optical Rotating Power. The property possessed by some substances of rotating the plane of polarization of a ray of polarized light through a certain angle.

Optical Square. A device comprising a fixed and a movable glass mirror used for demonstrating the effects of successive reflection.

Optical System. An arrangement of optical elements, such as mirrors and lenses, for the deviation of light rays.

Optical Thermometer. An instrument used for determining very high temperatures, based on the principle that the amount of rotation of the plane of polarisation in certain crystals varies with the temperature.

Optician. One versed in the science of optics; one who

makes or deals in optical instruments; one versed in the optical considerations of the eye, and capable of diagnosing and correcting its errors of refraction; a refractionist.

Opticist. A person skilled or engaged in the study of optics.

Optics. That branch of science which treats of the nature and the character of vision and light and the phenomena of sight.

Optigraph. A camera provided with mechanical drawing appliances to facilitate copying the projected image.

Optischer Brennpunkt (G). Visual focus.

Optisches Auge (G). Optical model of the eye.

Optogram. An image briefly impressed on the retina by the bleaching of the visual purple.

Optologist. A term recently introduced to denote an optician who devotes himself solely to vending spectacles and eyeglasses and to the diagnosis and correction of errors of refraction.

Optometrist. One versed in optometry.

Optometry. (*a*) The measurement of the range of vision. (*b*) The measurement of the visual powers in general.

Opto-technics. The technical applications of the science of optics.

Optotype. A letter of definite size used as a test of the acuteness of vision; a test-type.

Orbicular, Orbiculate, Orbiculated. Of the shape of an orb or orbit; spherical or circular.

Orbicularis Palpebralis. The muscle surrounding the circumference of the orbit and eyelids.

Orbicular Pupillary Reaction. A term referring to contraction of the pupil when a forcible effort is made to close the lids.

Orbit. The eyesocket.

Orbit. The path of a planet or comet.

Orbital. Pertaining to the eye-socket.

Orbitonasal. Pertaining to the orbit of the eye and to the nose.

Orbituary. Of, or pertaining to, an orbit; orbital.

Ordinary Ray. In doubly refracting crystals the ray the path of which follows the law of refraction.

Organoleptic. Making an impression upon an organ, as the eye.

Orient, Orientate. (*a*) To ascertain or determine the position of a body with respect to the points of the compass. (*b*) To turn towards the east.

Orientation. The act of taking bearings with respect to the points of the compass, or of ascertaining direction in general.

Orrery. A model to illustrate the motions and phases of the planets; same as cosmoscope or planetarium.

Orthoclastic, Orthotomous. Characterised by exhibiting cleavage in two directions at right angles to one another.

Orthochromatic. Rendering colours in correct relationship as to their intensities.

Orthocromatise. To bring into conformity with the conditions requisite to obtain a correct rendering of colour-values.

Orthogon. A rectangular figure.

Orthogonal. Pertaining to, or depending upon, the use of right angles.

Orthogonally. Perpendicularly.

Orthographic, Orthographical. Pertaining to right lines or angles.

Orthometer. An instrument for measuring the protrusion of the eyes.

Orthophoria. The tendency of the visual axes to parallelism, or perfect (normal) binocular equilibrium.

Orthoptic. A small stop, *i.e.*, an opaque screen having a small hole pierced in it, used by riflemen and others in taking sights.

Orthorhombic. Rectangular and rhombic.

Orthoscope. A cell capped with plane glass, for the retention of fluid before the eye, in order that the iris may be seen unaffected by the refraction of the cornea.

Orthoscopic. (*a*) Seeing correctly; having normal vision with respect to form. (*b*) So constructed as to project the optical images of objects correctly. (*c*) Characterised by normality of visual appearance.

Orthoscopic Lens. An achromatic doublet, giving a flat field of view, free from distortion.

Orthoscopic Ocular. An ocular specially designed to give a large, flat field.

Orthoscopic Spectacles. Spectacles, the lenses of which are cut out of the periphery of a large lens.

Orthotomic. Cutting at right angles.

Ortive. Relative to the rising of a star.

Oscillative. Having a tendency to oscillate; vibratory.

Otheoscope. A Crookes' radiometer.

Otoscope. An ear speculum.

Out of Focus. Not in focus.

Ouverture de l'objectif (Fr). Lens aperture.

Oval. Resembling an ellipse.

Ovalescent. Tending to an oval form.

Ovaliform, Oviform. Having the longitudinal section oval and the transverse circular.

Ovaloid. Somewhat oval.

Ovate, Ovated. (*a*) Having a figure similar to the longitudinal section of a hen's egg; oval, but broader at one end than at the other. (*b*) Resembling a hen's egg in figure.

Ovate-oblong, Ovato-oblong. Between ovate and oblong.

Ovate-rotundate, Ovato-rotundate. Roundly egg-shaped.

Ovate-subulate. Between ovate and subulate.

Ovato-ellipsoidal. Nearly ellipsoidal, but larger towards one end than towards the other.

Over Corrected. A term applied to lenses in which the central rays are focused sooner than the marginal rays.

Over-exposure. Exposure of the sensitive plate for a period longer than is necessary to produce a perfect picture.

Oxyblepsia. Abnormal acuteness of vision.

Oxygon, Oxygone. A triangle of three acute angles.

Oxygonal, Oxygonial. Acute-angled.

Ozonoscope. An instrument used for the exposure of ozonic test-papers.

P.

Pachometer, Pachymeter. An instrument for measuring small thicknesses.

Palpebra. The eyelid.

Palpebral. Of, or pertaining to, the eyelids.

Palpebrous. Having prominent superciliary ridges.

Pancratic Eyepiece. An eyepiece of variable magnifying power.

Panel Lens. A lens designed for making panel photographs.

Pannus. A dense white opacity of the cornea.

Panophthalmitis. Inflammation of all the tissues of the eyeball.

Panorama. A view or picture embracing the whole of the horizon.

Panoramic, Panoramical. Pertaining to, or of the nature of, a panorama.

Panoramic Camera. A rotatable instrument employed to make cycloramic photographs.

Panoramic Lens. A wide-angled lens.

Pantometer. An instrument for measuring angles in any direction.

Pantometric. Of, or pertaining to, pantometry, *i.e.*, the use of a pantometer.

Pantoscope, or Pantascope. A panoramic lens.

Pantoscopic, or Pantascopic. Having or affording a wide range of vision.

Pantoscopic Camera. Same as panoramic camera.

Pantoscopic Spectacles. Lenses, the upper and lower parts of which have different foci.

Papilla. Intraocular end of the optic nerve.

Papillæ lachrymales. The conical elevations on the upper and lower eyelids, at the inner canthus, containing the openings to the lachrymal canals.

Papillitis. Inflammation of the papilla. (Neuritis.)

Papilloretinitis. Inflammation of the retina as well as the optic nerve. (Neuroretinitis.)

Parabolic Lens. A lens of the shape of a paraboloid.

Parabolic Mirror. A mirror, every section of which through the principal axis cuts the surface in a parabola.

Parachromatism. Colour-blindness.

Paraheliotropism. A form of negative heliotropism.

Parallactic, Parallactical. Relating to parallax.

Parallax. The apparent displacement of an object observed resulting from displacement of the observer.

Parallelepiped, or Parallelopiped, Parallelepipedon. A prism whose bases are parallelograms.

Parallelepipedal, or Parallelopipedal, Parallelepipedonal. Having the form of a parallelepiped.

Parallelistic. Of the nature of, or involving, parallelism.

Parallelise. To render parallel.

Parallelly. In a parallel manner.

Parallelogram. A quadrilateral figure whose opposite sides are parallel.

Parallelogrammatic, Parallelogrammatical. Of, or relating to, a parallelogram.

Parallelogrammic, Parallelogrammical. Of the form of a parallelogram.

Parallelometer. An appliance for determining parallelism.

Paranthelion. A white diffuse image of the sun, formed at the same altitude with it, but at an angular distance of from 90° to 140°.

Paraselene. A bright spot on a lunar halo; a mock moon.

Paratonic, Paratonical. Relating to that action of light by which vegetable growth is retarded.

Parcel Camera. A camera made up as an ordinary brown paper parcel.

Parhelion. An intensification of a circular space in a solar halo.

Paropsis. Disordered sight-perception.

Parti-coloured, or Party-coloured. Variegated in colour.

Pebble. Rock crystal.

Pellicle. A thin skin or film.

Pelorus. An instrument for

detecting errors of the compass by the bearings of celestial objects.

Pellucid. Translucent.

Pellucidity. Translucency.

Pellucidly. Translucently.

Pencil. A number of divergent or convergent rays of light.

Penciliform. Having the form or appearance of an optical pencil.

Pendulum. (*a*) Anything which hangs free to swing under the influence of gravity. (*b*) Anything of which one end is fixed and the other end capable of swinging under the influence of a resilient or restitutive force.

Penetrating Power. The power of an optical system to produce focused images of an object with axial depth.

Pentagon. A figure of five sides and angles.

Pentagonal, Pentagonous. Having five angles.

Pentagrammatic. Pentagonally figurate.

Pentahedral, Pentahedrical, Pentahedrous. Having five faces.

Pentahedron. A solid having five faces.

Pentangle. A five-angled figure; a pentagon or pentacle.

Pentanguloid. Somewhat pentangular in shape.

Penultimate. Immediately preceding the last member of a series.

Penumbra. (*a*) The partial shadow within which the rays of light from an illuminated body are partly intercepted. (*b*) The dark fringe around the central part of a sunspot.

Penumbral. Pertaining to, or resembling, a penumbra.

Penumbrous. Of, pertaining to, or resembling a penumbra.

Periaxial. Surrounding an axis; peripheral with reference to an axis of any body.

Pericentral. Situated about a centre or central body.

Perichoresis. A going round about; a rotation.

Perigee. That point in the moon's orbit which is nearest to the earth.

Perihelion. The point in a planet's orbit at which it is nearest to the sun.

Perimeter. (*a*) The circumference, or a measure of the circumference or outer boundary, of a superficial figure. (*b*) An instrument for determining the visual sensitiveness of different areas on the retina.

Perimetric, Perimetrical. (*a*) Of, or relating to, the external boundary of a body. (*b*) Perimetral.

Perimetar. Pertaining to perimetry.

Perimetry, Perioptometry. The determination of the boundaries of areas of relatively distinct vision.

Periocular. Surrounding the eyeball.

Periocular Space. The space within the orbit not occupied by the eyeball.

Periophthalmic, Perioptic. Circumocular; orbital with reference to the eye; periocular.

Periorbital. Of, or pertaining to, the orbit of the eye.

Periostitis. Inflammation of the periosteal lining of the orbit.

Periotomy. Removal of a riband of conjunctival and subconjunctival tissue from round the cornea, for the relief of pannus.

Peripheral, Peripheric, Peripherical. Of, belonging to, or situated on a periphery.

Periphery. (*a*) The circumference of a circle or the boundary line of any closed figure. (*b*) The surface of a body.

Periscope. An optical instrument by means of which objects in a horizontal view can be seen through a vertical tube.

Periscopic, Periscopical. Giving distinct vision obliquely as well as axially.

Periscopic Lens. A lens shaped like a meniscus.

Periscopism. The faculty of periscopic vision.

Permutability, Permutableness. The state of being interchangeable.

Permutably. In a permutable manner.

Perrotatory. Passing again and again through all the members of a series.

Persistence of Vision. The phenomena of subpermanent positive or negative afterimages in the eye.

Perspective-glass. A terrestrial telescope or spy-glass.

Petrographical Microscope. A microscope specially adapted for the minute study of rocks.

Phacoscope or Phakoscope. A camera for exhibiting the changes of the crystalline lens of the eye in accommodation.

Phæochrous. Of a dark or dusky colour.

Phakomalacia. Soft cataract.

Phantasmagoria, Phantasmagory. An exhibition of, or an apparatus for, producing dissolving views.

Phantasmagorial, Phantasmagoric, Phantasmagorical. Illusive; relating to a phantasmagoria.

Phantasmograph. An apparatus for printing lantern slides.

Phantasmatography. A description of celestial appearances, as the rainbow, etc.

Pharyngoscope. An instrument for inspecting the pharynx.

Phenakistoscope. An instrument for producing a representation of objects in motion by superposing images upon the retina of the eye in quick succession.

Phlyctenular Conjunctivitis. Inflammation of conjunctiva, accompanied by small vesicles or blisters.

Phoroscope. A telegraph for the transmission of visual images.

Phosphene. The luminous image produced on subjecting the eyeball to mechanical pressure, or by coughing, or efforts at accommodation.

Phosphenes of Accommodation. Subjective sensations of light due to the contraction of the ciliary muscle during accommodation.

Phosphoresce. To emit a faint light, unaccompanied by directly perceptible heat; or to continue fluorescing after the removal of the exciting cause.

Phosphorescent. (*a*) Exhibiting phosphorescence. (*b*) A body having the property of phosphorescence.

Phosphorogenic. Capable of inducing phosphorescence.

Phosphorograph. An impression obtained by throwing a luminous image on a phosphorescent surface.

Phosphorography. The art of obtaining phosphorographic images.

Phosphoroscope. (*a*) An instrument for measuring the duration of evanescent phosphorescence. (*b*) A scientific toy for exhibiting effects of phosphorescence.

Photalgia. Pain caused by light.

Photantitypimeter. An actinometer.

Photics. The science of light.

Photocampsis. Refraction of light.

Photochemical. Of, or pertaining to, the chemical action of light.

Photochemistry. The branch of chemistry treating of the chemical action of light.

Photochromatic. Of, pertaining to, or produced by, photochromy.

Photochromolithograph. A chromolithograph in the production of which photographic processes have been used.

Photochromotype. A photographic picture in colours typographically reproduced.

Photochromy. The art of photography in colours.

Photochronograph. (*a*) An instrument for making photochronographic pictures. (*b*) A picture so made.

Photochronography. The process of taking, at given intervals of time, a number of instantaneous photographs of a moving, or otherwise changing, object.

Photodrome. A zoetrope, the successive images in which are exhibited by means of an intermittent or flashing light.

Photodynamic. Resulting from, or pertaining to, the energy of light.

Photodysphoria. Photophobia.

Photo-electric, Photo-electrical. Relating to the production of light by electricity.

Photogastroscope. An apparatus for photographing the inside of the stomach.

Photogene. A persistent image upon the retina.

Photogenic. Produced by, or due to, the action of light.

Photogenic Drawing. A picture produced by the action of light.

Photogeny. The art of photography.

Photograph. Any picture produced by any photographic process.

Photographic, Photographical. Of, or pertaining to, photography.

Photographic Telescope. A telescope, the objective of which is specially designed to bring the photographically active rays to a focus.

Photogram. (*a*) A photograph. (*b*) The representation of an optical image telegraphically transmitted; a chirographic or pictorial telegram.

Photography. The art of producing images by means of chemical changes due to the action of light.

Photographometer. (*a*) An appliance for determining the sensitiveness of photographic surfaces. (*b*) A pantoscopic camera adapted for surveying purposes.

Photogravure. The production of a photo-intaglio printing plate on metal.

Photohæmotachometer. An apparatus for recording changes in the velocity of the blood current by means of light.

Photoheliograph. A telescope adapted for solar photography.

Photokinetic. Causing motion by means of luminous rays.

Photologic, Photological. Of, or pertaining to, photology.

Photologist. One versed in photology or the science of light.

Photo-luminescence. Emission of cold light under the stimulation of light-waves.

Photomagnetism. The science correlating photic with magnetic phenomena.

Photometric or Photometrical Standard. Any unit of light employed in photometry.

Photometrician, Photometrist. One who is versed in photometry.

Photometric Units. Standard units of intensity of light.

Photometer. An instrument used for measuring the intensity of light.

Photometry. The measurement of the relative intensity of different sources of light.

Photomicrograph. A macroscopic photograph of a microscopic object.

Photomicrography. The photography of optical

images enlarged beyond the dimensions of the objects which they represent.

Photonephograph, Photonephoscope. A photographic apparatus for determining the distances of moving clouds by triangulation.

Photonosos, Photonosus. An affection of the sight, as snow-blindness, resulting from exposure to a glare of light.

Photophobia. Intolerance, or dread, of light.

Photophone. A telephone of which the transmitter impresses a periodic character upon a beam of light, by which the vibrations of the receiver are determined.

Photophony. The art or practice of using the photophone.

Photophosphorescent. Exhibiting phosphorescence under the influence of light.

Photophysical. Pertaining to the physical effect of light; opposed to photo-chemical.

Photopolarimeter. A name given to a form of polarimeter.

Photopsia, Photopsy. The condition of experiencing purely subjective sensations of light.

Photoptometry. The measurement of the acuteness of the sense of sight.

Photoret. A small photographic camera.

Photoscope. (*a*) An instrument for the qualitative, as distinguished from the quantitative, detection of light. (*b*) A photometer independent of visual comparisons of lights. (*c*) An apparatus for exhibiting photographs.

Photosphere. The visible surface of the sun.

Photospheric. Pertaining to the photosphere or luminous envelope of the sun.

Phototachometer. An instrument for measuring the velocity of light.

Phototachometry. The science of measuring the velocity of light.

Phototelegraph. An apparatus for the reproduction of optical images at a distance.

Phototheodolite. An instrument for the performance of triangulation by means of photographs.

Phototype (Fr). Negative.

Physical Optics. That branch of optics which treats of the

phenomena of double refraction, diffraction, interference, etc.

Physiological Optics. That branch of optics which treats of the conditions necessary for the act of vision.

Picture-lens. A long focus lens used for examining pictures.

Pigmentum nigrum (of the embryonic eye). The proximal lamella of the secondary optic vesicle.

Pinball-sight, Pinhead-sight. A bead-sight.

Pince-nez (Fr). Eyeglasses kept in position by a spring.

Pinces à tourmaline (Fr). Tourmaline tongs.

Pincushion distortion. Distortion caused by a convex lens.

Pinguecupa. A small tumor or yellowish thickening of the conjunctiva.

Pinhole Photography. Photography by means of a small hole, without the use of a lens.

Pioscope. A form of lactoscope.

Plain Compass. A simple form of surveying level and compass.

Planary. Flat; lying in one plane.

Planchette d'objectif (Fr). Camera front.

Plane Mirror. A plane reflecting surface.

Plan du foyer (Fr). Focal plane.

Plane of Polarisation. The plane in which a beam of plane polarised light is most copiously reflected by a sheet of glass set at the polarising angle.

Plane-plane. Having two plane surfaces parallel to each other.

Plane Polarisation. The restriction of the vibrations of the ether to which a ray is due to a single plane.

Planimeter. An instrument for the measurement of plane areas.

Plano-concave Lens. A lens with one plane and one concave surface.

Plano-convex Lens. A lens with one plane and one convex surface.

Plano-orbicular. Plane on one side and spherical on the other.

Planosubulate. Smooth and very acutely conical.

Plate Box. A box designed to exclude light, for the storage of photographic dry plates.

Platine (Fr). Stage.

Platine à chariot (Fr). Mechanical stage.

Platitude des champs (Fr). Flatness of field.

Platyscopic. Having a wide and flat field of view.

Pleochroic, Pleochromatic, Pleochrous. Characterised by pleochroism.

Pleochroism, Pleochromatism. The quality of certain crystals of exhibiting different colours when viewed in different directions.

Pluviograph. A self-recording rain-gauge.

Pluvioscope. A rain-gauge.

Point of Dispersion. The virtual focus of an optical system.

Point of Distance. In perspective that point of a picture where the visual rays meet.

Point of Incidence, Refraction, or Reflection. That point upon a surface at which a ray of light impinges, or is refracted, or reflected.

Point of Regard. A point at which the eye is directly looking.

Point of Sight, of View, or of Vision. The position from which anything is observed; the centre of projection.

Point of the Compass. An angular unit equal to $11\frac{1}{4}°$, being one-eighth of a right angle.

Polar Axis. An axis of an astronomical instrument set parallel to the axis of the earth.

Polar Clock. An optical apparatus which indicates the hour of the day by means of the state of polarisation of the light from the sky.

Polarimeter. An instrument for measuring the amount or angular direction of polarised light.

Polarimetry. The art of measuring or analysing the state of polarisation of light.

Polariscope. An appliance for exhibiting phenomena depending on the polarisation of light.

Polariscopist. One who is expert in polariscopic work.

Polariscopy. That branch of

optics dealing with the investigation of polarised rays.

Polariser. The first polarising prism in a polariscope.

Polarising Prism. A device which makes use of the refractive properties of certain substances to obtain polarised light. The most important is the Nicol, but there are many other modifications, such as Glan's, Foucauld's, Thompson's, Dove's, Prazmonsky's, etc.

Polaristrobometer. An instrument for measuring the rotation of the plane of polarisation of light in traversing any medium.

Polarisable. Capable of being polarised.

Polarisation. The restricting of the vibrations in a beam of light to those which are similar and in the same direction.

Polarise. To develop polarsation in.

Polarisation Microscope. A microscope with a polarising attachment.

Polarisation Photometer. A photometer which measures the intensity of a source of light by making use of the properties of polarised light.

Pole. In any more or less spherical body, one of two opposite points of the surface in any way distinguished; or, when there is a marked equator, one of the two points most remote from it.

Polemoscope. A perspective or opera glass provided with a mirror so that persons may be scrutinised without obviously directing the glass towards them.

Polyaxial. Having several axes; multiaxial.

Polychroic. Same as pleochroic.

Polychroism. Same as pleocrhroism.

Polychromatic. (*a*) Many-coloured. (*b*) Exhibiting a play of colours.

Polychrome. Tinted with several or many colours.

Polycoria. A malformation consisting of a multiplicity of pupils in the eye.

Polygon. A figure possessing many angles.

Polygonoscope. A kaleidoscope in which the angular distance between the mirrors is adjustable.

Polymicroscope. (*a*) A microscope adapted for simultaneous use by several

observers. (*b*) A microscopical peep-show, consisting of a microscope in combination with a series of slides mounted upon an endless chain.

Polymorphic, Polymorphous. Having several or many forms.

Polyopia, Polyopsia. Multiple vision.

Polyprism. A compound prism composed of several prisms of different materials, arranged on a common axis.

Polyoptrum, Polyoptron. A multiplying and diminishing lens; a multiplying glass with concaved facets.

Polyorama. (*a*) A view of many objects. (*b*) An optical apparatus presenting many views.

Polyhedrometry. The science of the measurement of polyhedra.

Polyhedron. A solid bounded by plane faces.

Polyphotal. Pertaining to the emission of more than one beam of light.

Polyphote. An optical system by which several beams of light are projected in different directions.

Polyscope. (*a*) A multiplying glass. (*b*) An optical instrument adapted to illuminate the several cavities of the body.

Porraceous. Resembling the leek in colour; greenish.

Porte-lumière. An adjustable plane reflector.

Position-finder. A piece of apparatus whereby a gunner can locate, and direct, his sight towards an object not visible to him.

Positive Crystals. Uniaxial crystals in which the index of refraction of the extraordinary ray is greater than that of the ordinary ray.

Positive Eye-piece. A combination of lenses which intercepts the rays from the objective after they have come to a focus at which micrometric cross-hairs can be adjusted.

Positive Lens. Any lens thicker in the middle than on the edges.

Positive Ocular. An ocular in which the real image formed by the objective is below the ocular.

Posterior Synechia. Adhesion of the posterior surface of the iris to the anterior capsule of the lens.

Post-ocular Neuritis. Inflammation of the optic nerve behind the eye.

Positive. A view of any object in which the lights and shades correspond with those of the object viewed.

Pouvoir (Fr). Power.

Praeparir-Mikroskop (G). Dissecting microscope.

Prasine, Prasinous. Of a yellowish-green colour.

Prasoid. Resembling prase, a green-tinted variety of quartz.

Praxinoscope. A form of zoetrope or phenakistoscope.

Precorneal. Situated on the front of the cornea.

Preocular. Situated before the eye.

Presbyope, Presbyte. A person affected with presbyopia.

Presbyopia, Presbyopy. Far or old-sight. Diminished power of accommodation for near vision.

Prescription-glass. A spectacle-lens made to prescription.

Primary Colours. Colours that cannot be resolved in two or more colours.

Primary Deviation of the Eye. The deviation of the originally squinting eye.

Prime Vertical Transit Instrument. An astronomical instrument used for observing the transit of stars over the prime vertical.

Principal Axis. The line passing through the centre of a lens or a mirror and the centre of curvature of the surface of which the lenticular or specular surface is a segment.

Principal Focus. The focus of rays parallel to the optical axis.

Principal Planes. Two planes so situated with respect to a compound lens system that the effect of the system is equivalent to that of an infinitely thin lens which receives light whilst in one of these planes and is suddenly transferred to the other before the emergence of the light.

Principal Ray. The ray which passes perpendicularly from the eye to the picture.

Principal Section. Any plane passing through the optical axis.

Prism. A transparent optical device, mostly of a triangular

cross-section, the refracting surfaces of which form an angle with each other.

Prisma (G). Prism.

Prismatic. Separated or distributed by an optical prism; refracted by a prism.

Prismatically. By means of, or in the form or manner of, a prism.

Prismatic Colours. The colours into which a ray of light on passing through a prism is decomposed.

Prismatic Compass. An optical apparatus such that an object on the horizon can be sighted through a pair of vanes at the same time that the alignment of a magnetic compass needle is read off.

Prismatic Lens. A lens with one or more concave or lenticular surfaces.

Prismatoid. A solid terminated by two parallel polygons connected by triangular faces.

Prism creuse (Fr). Hollow prism.

Prismes croissés (Fr). Crossed prisms.

Prism-diopter. That prism which has the power to deflect rays of light passing through it, and to a distance of one meter beyond, exactly one centimeter.

Prisme redresseur (Fr). Image-reversing prism.

Prismoid. A body approaching the form of a prism.

Prismoidal. Having or relating to a prismoid.

Prism-spherometer. A prism for ascertaining the curvature of a spherical surface.

Prism-train. A series of dioptric prisms.

Prisoptometer. An instrument for detecting and correcting errors of refraction.

Probe-objekt (G). Test-object.

Profondeur de foyer (Fr). Depth of focus.

Projection. The process of throwing an optical image of an object on to a screen.

Projectionsapparat (G). Optical lantern.

Projectionslaterne (G). Sciopticon.

Projective. Produced by projection.

Projecture. Projection.

Proof-glass. A hydrometer-glass.

Proptosis. Protrusion of the eyeball. (Exophthalmia.)

Psychrometer. A wet and dry bulb thermometer.

Psychrometric, Psychrometrical. Of, or pertaining to, a psychrometer.

Psychrometry. Hygrometry.

Pseudoblepsia, Pseudoblepsis. Visual illusion; parablepsia.

Pseudochromaesthesia. An anomaly in the perception of visual sensations, in which the different vowels of words appear, each coloured in a separate tint.

Pseudochromia. False perception of colour.

Pseudodiascope. An appliance for producing an optical illusion depending upon a transposition of ocular impressions.

Pseudopsia. False sight-perception.

Pseudoscope. A modification of the stereoscope, by which the natural effects of relief are inverted.

Pseudoscopic, Pseudoscopical. Pertaining to the pseudosocope.

Pseudoscopy. The use of the pseudoscope, or the production of effects similar to those exhibited by it.

Pterygion. Varicose excrescence of the conjunctiva.

Pterygium. A triangular patch of thickened conjunctiva, with its apex towards the cornea.

Ptosis. A falling, a prolapse, of the upper eyelid.

Punctum Cæcum. The blind spot of the retina.

Punctum Lachrymale. The commencement of the lachrymal canal, the minute aperture presented above and below the edge of each eyelid at the inner corner.

Punctum Luteum. The central yellow spot of the retina.

Punctum Proximum. The near point. The nearest position to the eye at which a fine object can be seen sharply and without blurring.

Punctum Remotum. The far point. The greatest distance at which an object can be clearly seen.

Puniceous. Of a purplish-red colour.

Pupil. A circular aperture in the iris for transmitting light.

Pupilary or Pupillary. Relating to pupil.

Pupillary Membrane. A thin

transparent membrane closing the eye for a time and dividing the space in which the iris is situated into two chambers. May cause blindness.

Pupillometer. An instrument for measuring the size of the pupil.

Purblind. Dim-sighted.

Purkinje's Image. The image of the retinal blood vessels seen under certain conditions by the eye.

Purpureal. Purple.

Purpurescent. Tinged with purple.

Pyoscope. An optical appliance for the estimation of fat in milk.

Pyrheliometer, Pyroheliometer. A calorimeter for measuring the heating power of the solar rays.

Pyrogenetic. Heat-producing.

Pyrognomic. Exhibiting phosphorescence when heated.

Pyrology. The science of heat.

Pyrometer. A high-temperature thermometer, generally constructed without a fluid element.

Pyrometry. High temperature thermometry.

Pyrophanous. Rendered transparent or translucent by heat.

Pyrophotography. Any photographic process in which heat is used to fix the image.

Pyroscope. An instrument for measuring the thermal intensity of radiation.

Q.

Quadrangle. A plane figure having four angles; a quadrilateral.

Quadrangular. Having four angles.

Quadrant. (*a*) The quarter of a circle; the arc of a circle containing 90°, or the figure included between this arc and radii drawn from the centre of the circle to each extremity. (*b*) The navigational instrument better described as the reflecting octant.

Quadrant of Altitude. A graduated quadrant meridionally fixed with respect to an artificial globe.

Quadrat. An instrument having sights, a plummet, and an index for the approximate measurement of altitudes.

Quadrate. (*a*) Square. (*b*) To divide into four equal parts. (*c*) To square, fit, or agree.

Quadrifarious, Quadriserial. Disposed in four rows or series.

Quadrifocal. Having four foci.

Quadriform. Having a fourfold aspect.

Quadrifrons. Having four faces.

Quadrifurcate, Quadrifurcated. Doubly dichotomous.

Quadrisection, Quartisection. A section into four equal parts.

Quadriseptate. Having four septa or partitions.

Quadruplex, Quadruplicate. Fourfold.

Quadruple Vision. The simultaneous perception of four visual images.

Quadruplication, Quadruplicature. The act of making fourfold.

Quadruplicity, Quadruplexity. The state of fourfoldness.

Quadruply. In a quadruple degree.

Quaquaversal. Inclined uniformly in all directions from a central point or area.

Quarter-square. The fourth part of the square of a number.

Quarter-undulation. A quarter of a wave-length.

Quartilunar. Pertaining to, or consisting of, one-fourth of a lunar month.

Quartzose, Quartzous. Composed of quartz.

Quinary. Fivefold; composed of five parts or elements.

Quindecagon. A plane figure of fifteen sides and angles.

Quinquangular, Quinqueangled. Having five angles.

Quinquesection. Partition by five.

Quinqueseptate. Having five septa or partitions.

Quinqueserial. Disposed in five rows or series.

Quintuple. (*a*) Fivefold. (*b*) To increase fivefold.

Quintuplicate. (*a*) Quintuple. (*b*) One of five things in every respect similar to each other.

Qui peut être échangé (Fr). Exchangeable.

R.

Rack and Pinion Adjustment. A rough and ready adjustment of an optical instrument comprising a pinion engaging with a rack.

Rack-caliper, Rack-compass. A caliper or compass of which the legs are adjusted by a rack and pinion motion.

Radian. The angle (57°-.295779, etc., or 57° 17′ 44″ .8062, etc.), which is subtended at the centre of a circle by an arc equal in length to the radius.

Radiance, Radiancy, Radiantness. The state or quality of being radiant.

Radiant. Shooting or emitting rays of light; giving out rays; resembling rays.

Radiant Energy. Energy transmitted through, or by means of, the luminiferous ether.

Radiant Heat. Heat passing through space in vibrations similar to those of light, but of a wave-length that cannot be perceived by the eye.

Radiantly. By radiation; in the manner of rays.

Radiate. To issue, or cause to issue, rays from a point; to spread directly outward.

Radiation. The communication of vibrative motion to the luminiferous ether.

Radiant Matter. A name given to highly rarified gases, which are found to produce certain mechanical and luminous effects when an electrical discharge is passed through them.

Radiant Point. Any luminous point from which light proceeds.

Radio-activity. The property of some substances by virtue of which they emit radiations of great penetrating power, the source of which is as yet unknown.

Radiograph. (*a*) An instrument for measuring and recording the intensity of solar radiation. (*b*) The life size shadow picture of an object.

Radiographer. One skilled in obtaining radiographs.

Radiography. The art or process of taking life size shadow pictures of an object.

Radiometer. (*a*) An instrument for measuring the intensity of radiant energy. (*b*) An instrument for the approximate measurement of visual angles.

Radiophone. An apparatus for the production of soniferous pulsations by the incidence of an intermittent beam of radiant heat (Actinophone).

Radius. A semidiameter; one of a number of lines extending from a centre.

Radius of Curvature. The radius of the circle of curvature.

Rainband. A dark band situated on the red side of the D line in the spectrum.

Rainband Spectroscope. A spectroscope specially designed for the examination of the terrestrial lines of the solar spectrum, produced by the moisture of the atmosphere.

Rainbow Quartz. An iridescent variety of quartz.

Ramsden's Ocular. A positive eyepiece, comprising two plano-convex lenses, the convex surfaces of which face each other.

Ramous, Ramose. Having branches; ramified.

Randschärfe (G). Marginal definition.

Range-finder. An appliance for determining the distance of an object under observation.

Range of Accommodation. The distance between the farthest and nearest point of distinct vision.

Rapidity of a Lens. A term used in photography to indicate the efficacy of a lens in producing changes in a photo-sensitive plate.

Rapid Lens. Any lens that allows a large quantity of light to pass through.

Rapid Rectilinear Lens. A rapid lens corrected for aberration.

Ratio. The relation between two similar magnitudes in respect to quantity.

Rational Horizon. The astronomical horizon.

Ray. A line of light, or some other form of radiation; scientifically: the normal to the wave surface.

Rayometer. A kind of actinometer.

Rayon de lumière (F). Ray of light.

Reactive. Pertaining to, causing, or caused by reaction; acting reflectively or reciprocally.

Reactively. By reaction.

Reactiveness. The quality of being reactive.

Reactivity. The state of being reactive.

Real Image. An image, whether due to refraction or reflection, each point of which is formed by rays proceeding from a corresponding point of the object.

Reaminess. A wavy condition, as the surface of a coat of too viscous collodion.

Réaumur's Scale. A thermometric scale, in which the freezing and boiling points of water are respectively marked 0° and 80°.

Rechteckig (G). Rectangular.

Reclination. The angle which the plane of a sun dial makes with a vertical plane which it intersects in a horizontal line.

Reclination. An old method of operating for cataract.

Rectangle. A quadrilateral plane figure, having all its angles, right angles and its opposite sides consequently equal.

Rectangled, Rectangular. Having an angle or angles of 90°.

Rectangularly Polarised. Polarised in two planes at right angles to one another.

Recti (Muscles). Four straight muscles attached to the back of the bony orbit, round the edges of the hole through which the optic nerve passes, and running straight forward to their insertion into the sclerotic.

Rectiligne (Fr). Rectilinear.

Rectilineal. Composed of straight lines.

Rectilinear. Pertaining to or resembling a straight line.

Rectilinearity, Rectilinearness. The state of being rectilinear.

Rectilinearly. In a right line.

Rectilinear Lens. A lens that gives an image free from distortion.

Recurvate, Recurve. To curve backward.

Recurvation, Recurvity. The process of recurvature.

Recurvous. Bent backward.

Reductive. Having the power or effect of reducing; tending to reduce.

Re-entrant Angle, Re-entering Angle. An angle of which the apex is towards the interior of the figure in which it occurs, or of which the apex recedes with reference to the point of view from which it is considered.

Reflecting Camera. A form of camera obscura.

Reflecting Goniometer. An instrument for measuring the angles of a crystal by means of the deflection of a ray of light incident on its surface.

Reflecting Microscope. A microscope, in which the object, placed either outside the tube or outside the axis of the tube, is reflected by means of an inclined plane mirror.

Reflecting Stereoscope. A stereoscope wherein the superposition of the views respectively adapted to the right and left eye is effected by means of mirrors or reflecting prisms.

Reflecting Telescope. A telescope wherein the rays proceeding from the object viewed are focused by means of a concave mirror.

Reflection, Reflexion. The sending back of rays of light by the surface on which they fall into the medium from which they came.

Reflective, Reflexive. (1) Giving reflections; reflecting. (2) Having a tendency to, or characterised by, reflection.

Reflectively. In a reflective manner.

Reflectiveness, Reflexiveness. The state or quality of being reflective.

Reflectory. Capable of being reflected.

Reflet (Fr). Having an iridescent lustre.

Reflexibility, Reflexity. The capacity of being reflected.

Reflexible. Capable of being reflected.

Refract. To bend or turn from the direct course; to deflect a ray.

Refractable, Refrangible. Capable of being refracted.

Refracting Angle. The angle at the apex of a refracting prism.

Refracting Dial. A form of sun dial, having a glass lens in place of a gnomon.

Refracting Surface. The surface which separates two transparent media, and to which the change in the

direction of a ray of light is due.

Refracting Telescope. A telescope transmitting the rays to a focus through a combination of lenses.

Refraction. The change of direction of a ray passing from one medium to another of different density, or when traversing a medium the density of which is not uniform.

Refraction Circle. An instrument by means of which indices of refraction can be measured.

Refractionist. A person skilled in testing the eye for errors of refraction, and compensating for the same by physical means.

Refraction of the Eye. The action of the eye when passive and in a state of rest.

Refractive, Refringent. Of, or pertaining to, refraction; refracting.

Refractiveness. The state or quality of being refractive.

Refractometer. An instrument for measuring the refractivities of substances.

Refrangible. Capable of being refracted.

Refrangibility, Refrangibleness. The state or property of being refracted.

Réfringence (Fr). Refrangibility.

Refulgently. With great brightness.

Regenbogenhaut (G). Iris.

Regular Reflection. Reflection in which the incident and reflected rays make equal angles with the normal to the surface at the point of incidence.

Relative (Fr). Reciproca'.

Relumine. To light anew.

Renforçation (Fr). Intensifier.

Réseau (Fr). Gitter.

Resolving Power. The numerical expression of the power of an optical system to differentiate two or more lines or points.

Resonance, Resonancy. The prolongation or intensification of vibratory motion in virtue of the communication of a part of its energy to a new vibratile system.

Resorb. To re-absorb.

Resorbent. Adapted to absorb again that which had been given out.

Retardation. (*a*) A negative acceleration, or continuous decrement of velocity. (*b*) The distance by which one soniferous or luminiferous wave is behind another.

Retiary, Reticular, Reticulate, Reticulated. Net-like; netted.

Reticle, Reticule, Reticulum. A network of ruled lines or fibers such as is used in many optical micrometers.

Réticule (Fr). Crosswires.

Retinal. The innermost of the three coats of the eyeball, made up of the expansion of the optic nerve, and constituting the chief and essential section of the organ of vision.

Retinal Cones. Bulbous bodies in the layer of rods and cones of the retina.

Retinal Fatigue. A state of decreased sensitiveness of the optic nerve.

Retinal Horizon. The horizontal plane which passes through the transverse axis of the eyeball.

Retinal Image. The image formed upon the retina by rays of light passing from an outside object through the visual mechanism of the eye.

Retinal Purple. Visual purple or rhodopsin; a photosensitive pigmentary substance occurring in the outer segments of the retinal rods.

Retinal Rods. Cylindrical bodies, consisting of an inner and outer segment cemented together, in the layer of rods and cones of the retina.

Retinitis. Inflammation of the retina.

Retinitis Pigmentosa. Atrophy of the retina.

Retinoscope. An instrument used in retinoscopy.

Retinoscopy. (*a*) Ocular examination of the retina. (*b*) Skiascopy.

Retinoskiascopy. Same as Skiascopy.

Retouching-desk or -frame. A framed sheet of ground glass, adjustable in angle, used in retouching negatives.

Retouching-easel or -table. A retouching desk mounted on a stand.

Retouchment. The art or process of retouching, or the state of being retouched.

Retrobulbar. Being behind the eyeball.

Retrobulbar Neuritis. Inflammation of the optic nerve, accompanied by pain about the temple or on movement of the eye.

Révélateur (Fr). Developer.

Reverberator. That which reflects vibratory motion, especially light.

Reversal of the Image. A phrase applied in photography to the phenomenon resulting in the parts of the image which should appear light, becoming dark, and *vice versa*.

Reversatile. Reversible.

Reversing Layer. A hypothetical absorptive stratum of the solar atmosphere.

Reversing Prism. A small obtuse-angled isoseles prism of flint glass.

Reversive. Causing or tending to cause reversal or reversion.

Revolute. Rolled or curled backwards or downwards.

Revolution. (*a*) Same as rotation. (*b*) The act of moving completely round a circular or oval course, independently of rotation. (*c*) A cycle of periodic or recurrent changes.

Revolvable. Capable of being revolved.

Revolvment. The act of revolving.

Revolvency. The state or process of revolving.

Revolver (G, Fr). Nosepiece.

Revolving Diaphragm. A round plate of metal, perforated with holes of different diameter, which can be brought into the axial line of the lens.

Rhomb, Rhombus. An oblique-angled equilateral, quadrilateral figure.

Rhombic, Rhombical. Having the figure of a rhomb.

Rhombiform. Rhombic or rhomboid.

Rhombohedral, Rhombohedric. Of, or pertaining to, a rhombohedron.

Rhombohedron. A solid bounded by six rhombic planes.

Rhomboid. (*a*) A quadrilateral figure whose opposite sides and angles are equal, but which is neither equilateral nor equiangular; a non-equilateral oblique parallelogram; a rhomboides. (*b*) Having a form approaching that of a rhomb; rhomboidal.

Rhinoscope. An instrument used in ocularly examining the interior of the nose.

Rhodophane. A red pigment occurring in the retinal cones of some inferior animals.

Rhodopsin. Retinal purple.

Right-angled. Containing a right angle or right angles; rectangular.

Right-angle Prism. A prism so attached to the stand of a microscope that it can be rotated either on a horizontal or vertical axis.

Rimose, Rimous. Full of chinks, clefts, or crevices.

Rimulose. Full of small cracks or chinks.

Ring-dial. A portable sun-dial of annular form.

Ringlinse (G). Annular lens.

Rodent Ulcer. A chronic inflammation, beginning on one margin of the cornea and eating its way to the opposite margin (Ulcus rodens).

Roentgen Ray. Same as X rays.

Rosaceous. Rose-red; rose-ate.

Rotascope. Same as Gyroscope.

Rotatably. In a rotatable manner.

Rotative. (*a*) Causing rotation. (*b*) Pertaining to rotation; rotational.

Rotatory. Pertaining to producing rotation of the plane of polarisation.

Rotatory Polarisation. The change of the plane of polarisation of a plane polarised ray to the right or left when passing through certain substances.

Rotatory Power. The property possessed by a large number of substances of rotating the plane of polarisation.

Rotundity, Rotundness. Sphericity; globularity.

Rubedinous. Reddish.

Rubedity. Ruddiness.

Rubescence. The state of becoming or being red.

Rubescent. Tending to a red colour.

Rubific. Making red; communicating redness.

Rubification. The act of making red.

Rubiform. Characterised by redness.

Rubify. To redden.

Rubiginose, Rubiginous. Having the colour of iron-rust, brown-red.

Rubineous. Resembling a ruby in colour.

Rufescence. Tendency to a rufous or dull red colour.

Rufescent. Verging towards a dull red colour.

Rupert's Drops. Drops of molten glass suddenly cooled by being dropped into cold water.

Rutilant. Shining; glittering.

Ruvid. Rough.

S.

Sac, Lachrymal. The dilated upper (blind) portion of the lachrymal duct.

Saccharimeter, Saccharometer. A polarimeter for the optical estimation of the strength of sugar solutions.

Saccharimetrical. Of, pertaining to, or effected by, saccharimetry.

Saccharinity. The quality of being saccharine.

Saccharoidal. Having a crystalline granular structure resembling that of lump sugar.

Sagital. Pertaining to, or resembling, an arrow; straight.

Salimeter, Salinometer, Salometer. An instrument for measuring the density of solutions of common salt.

Sammellinse (G). Convergent lens.

Sanson's Images. The reflections from the anterior surface of the cornea, and the anterior and posterior surfaces of the lens of the eye.

Scale-micrometer. A linear, finely-graduated scale.

Scalene, Scalenon, or Scalenous Triangle. A triangle having three unequal sides.

Scalenum. A scalene triangle.

Scatteredly. In a dispersed or diffused manner.

Schachsenkreuzung (G). Horopter.

Schärfe (G). Definition, sharpness.

Scheinbar (G). Apparent.

Scheiner's Experiment. The observation of an image, or double image, of a wire, by viewing it through a card

having two pinholes closer to one another than the diameter of the pupil.

Schematic or Reduced Eye. A simplified optical system equivalent to the human eye.

Schlemm's Canal. A lymphatic canal of the eye, situated near the ciliary muscle.

Schiefwinkelig (G). Oblique-angled.

Schiller. A lustre, sometimes iridescent, due to microscopic inclusions in a transparent substance.

Schillerization. A peculiarity in the structure of some crystalline bodies which causes them to shine with a metallic lustre when turned in different directions.

Schillerize. To have that structure which causes the phenomenon known as schillerization.

Schistoscope. A polariscope used for the formation of complementary colours.

Schnelligkeit (G). Velocity.

Schnittweite (G). Focal length.

Schwingen (G). To oscillate.

Sciagraphy, Skiagraphy. (*a*) The art of determining the time of day or night by the shadows caused by some heavenly body. (*b*) The art of correct shading.

Sciametry. The scientific doctrine of eclipses.

Sciascopy. Same as Skiascopy.

Scintillant, Scintillous. Emitting sparks or little flashes of light.

Scintillate. To emit or send forth sparks or flashes of light.

Scintillometer. An instrument for determining the amount of stellar scintillations.

Scioptic, Scioptric. Of, or pertaining to, the camera obscura.

Scioptic Ball. A perforated wooden ball containing a lens, used to project a picture on to a screen or table.

Sciopticon. A magic lantern.

Scioptics, Scioptrics. The art of the optical projection of images.

Sclera, Sclerotic, Sclerotica. The external coat or tunic of the eyeball.

Scleral. Of, or pertaining to, the sclerotic coat of the eye.

Scleritis. Inflammation of the external coat of the eyeball.

Sclerocorneal. Of, or pertaining to, the sclerotica and cornea of the eye.

Sclero-kerato-iritis. Inflammation involving the sclerotic, cornea and iris.

Sclerometer. An instrument for the determination of degrees of hardness.

Sclerotic, Sclera. The tough, opaque outer coat of the eyeball.

Sclerotica. The sclerotic coat.

Scleroticitis, Sclerotitis, Scleritis. Inflammation of the sclerotic coat of the eyeball.

Scleroticochoroiditis. Elongation of the eyeball, due to inflammation of the sclerotic and choroid tunics.

Scleroticotomia. The operation of cutting through the sclerotic coat.

Sclerotome. A knife used in sclerotomy.

Sclerotomy. The making of an incision through the sclerotic coat.

Scotographoscope. An instrument for showing diagrams in a dark room.

Scotoma, Scotome. A patch in the visual field corresponding to some abnormality in the retina.

Scotomy. Imperfect vision, accompanied by giddiness.

Scotometer. An instrument for detecting scotomata.

Scotoscope. A night-glass.

Screw-collar. A device for adjusting the distance between the lenses of an objective.

Searching Ocular. A low-power eye-piece used in combination with high power objectives.

Second Nerve. The nerve proceeding from the brain which terminates in the expansion called the netina (optic nerve).

Secondary Axes. Lines passing through the centre of a lens or a mirror in a direction oblique to that of the principal axis.

Secondary Colours. A colour obtained by mixing two of the so-called primary colours.

Secondary Deviation of the Eye. The movement of the healthy eye excluded from

the visual act, whilst the patient is made to use the squinting eye only.

Secondary Magnification. The process of enlarging the real image formed by a positive lens by means of a second positive lens.

Secondary Spectrum. The residual chromatic aberration observed when employing an ordinary achromatic lens.

Section-cutter. An instrument used for cutting microscopic sections.

Section-liner. A form of parallel ruler.

Section-plane. A plane exposed by section.

Sectioplanography. A method of laying down the sections of engineering work.

Sector. (*a*) A plane figure enclosed between an arc and two radii. (*b*) A solid generated by the evolution of a plane sector about one of its radii.

Sector of a Sphere. The solid generated by the revolution of the sector of a circle about one of its radii.

Sectoral. Of, or pertaining to, a sector.

Sectoral Barometer. A mercury barometer which is read by measuring the inclination of the tube at which the fluid touches a fiducial mark therein.

Segment. A part cut off from any figure by a line or plane.

Segment of a Line. The part of a line embraced between two points.

Segment of a Sphere. Any portion of a sphere cut off by a plane not passing through the centre.

Segmental, Segmentary. Having the form of a segment.

Segmentate. Segmented.

Seitlich (G). Lateral.

Selective Absorption. The process of absorption of some of the constituent rays of an incandescent solid body when passing through a gas at a lower temperature, or through some solids or liquids.

Selenograph. A delineation of the moon's surface.

Selenographer, Selenographist, Selenologist. A student of selenography.

Selenographic, Selenographical, Selenological. Pertaining to selenography.

Selenography, Selenology. The scientific study of the moon.

Selenotropic. Tending to curve or turn towards the moon.

Self-focusing. Focusing without any artificial adjustment.

Self-luminous. Possessing in itself the property of emitting light.

Self-recording, Self-registering. Recording or registering automatically.

Self-regulation. Pertaining to automatic regulation.

Semaphone. A signalling apparatus.

Semaphone Lens. A modified form of Fresnel's lens.

Semaphoric, Semaphorical. Relating to a semaphore or semaphores.

Semasphere. A signalling balloon.

Sematrope. A kind of heliotrope.

Semiangle. The half of a given or measuring angle.

Semiannular. Forming a half annulus.

Semicylinder. Half a cylinder in longitudinal section.

Semicylindric, Semicylindrical. Of semi-circular action.

Semidiaphaneity. Imperfect transparency.

Semilunar Fold. A fold in the conjunctiva of the eye.

Semi-opaque. Translucent, but not transparent.

Semi-translucent. Partly translucent.

Seneca's Microscope. A single magnifying lens, consisting of a glass globe filled with water.

Sens de la vue (Fr). Sense of sight.

Sensible horizon. The apparent horizon.

Sensibilisiren (G). To sensitise.

Sensitisation. The act, process, or result of sensitising.

Sensitiser. One who or that which renders sensitive.

Sensitive. Capable of being modified by the action of light.

Sensitiveness. The state of being sensitive.

Sensitise. To render capable of being affected by the action of light.

Sensitometer. An instrument

for use in the determination of degrees of sensitiveness.

Septangle. A heptagon.

Seriatim. So as to be, or make, a series; one after another.

Seriation. The formation of an orderly sequence or series.

Serpiginous Ulcer. A destructive inflammation of the cornea, peculiar to the debilitated and aged (Ulcus serpens).

Set-fair. A point of the barometric scale assumed to correspond to settled fair weather.

Setting Circle. A graduated circle attached to a telescope, used in finding a star.

Sexangle. A figure of six sides and angles; a hexagon.

Sextant. (*a*) A nautical instrument used in determining latitude. (*b*) The sixth part of a circle.

Shadow. (*a*) A deficiency of light within an illuminated region. (*b*) An image due to reflected light.

Shadow Bands. Phenomena observed during a total eclipse.

Shadow-test. The skiascopic examination of ocular refraction.

Shanking. Roughly trimming the edge of a lens by means of pliers; nibbling.

Short-sighted. Myopic.

Show-glass. A magic mirror.

Show-stone. A magic mirror of quartz crystal.

Sidereal Motion. Diurnal motion.

Side-reflector. A small concave mirror used to throw light on to the stage of a microscope.

Siderostat. A heliostat regulated to siderial time.

Siderostatic Telescope. A fixed telescope used for astronomical observations by the aid of a siderostatic mirror.

Side-transit. A transit instrument having the eyepiece in the horizontal axis and provided with a reflecting prism.

Sichtbarkeit (G). Visibility.

Sight. (*a*) The ability to perceive objects by means of the eyes. (*b*) Scope of vision; limits of visual perception.

Sight-vane. A metal leaf having a pin-hole or slit-sight in it.

Silhouette. A monotint shadow figure.

Silver-bath. (*a*) A solution of nitrate of silver used for sensitising photographic surfaces. (*b*) A vessel for the use of such a solution.

Silver-printing. The production of photographic prints by the agency of a salt of silver as sensitiser.

Simulacrum. (*a*) An image or shadowy likeness of anything. (*b*) A formal sign.

Sinic ink. Chinese or Indian ink.

Sinistrad. Towards the left side.

Sinistral. Left hand; not dextral.

Sinopia, Sinopis. A red ochre.

Siphon-gauge. A mercurial vacuum-gauge.

Siphon-barometer. A barometer, the lower end of the tube of which is bent upwards.

Sixth Nerve. The nerve supplying the external rectus muscle of the eye.

Skiagraph. A permanent shadow picture produced by Roentgen rays.

Skiascopy. Shadow-test; a method of estimating ocular refraction by observing the movement of an illuminated spot on the retina, which occurs as the direction of the beam producing that spot is altered. Also called retinoskiascopy, horoscopy, keratiscopy, pupilloscopy, and retinoscopy.

Sky-line. The horizon.

Skyscape. A picture of the sky or clouds.

Slantingly, Slantly, Slantwise. In an oblique manner or direction.

Slide-rule. A pair of scales arranged to slide one on the other, so that when any given number on the one scale is brought to coincide with a given number on the other, the product or some other function of the two numbers is obtained by inspection.

Sliding-gauge. An instrument for measuring and setting off distances.

Smoky Quartz. A brownish yellow variety of quartz.

Snow-blindness. Amblyopia caused by the reflection of light from snow.

Snow-blink. The appearance due to reflection of light from a surface of snow.

Snow-eyes. A crude form of

snow spectacles long in use among the Eskimos.

Snow-goggles, Snow-spectacles. Screens used to shade the eyes in some degree from the glare of light reflected from a surface of snow.

Snow-gauge. An instrument resembling a rain-gauge, for receiving and measuring falling snow.

Soemmering's Mirror. A plane mirror, disc-shaped, and smaller than the pupil of the eye, used in micrography in place of the camera lucida.

Soemmering's Spot. The macula lutea, or yellow spot of the retina.

Solar Camera. A copying camera for use with direct solar light.

Solar Chronometer. A sun dial graduated to indicate solar time.

Solar Eye-piece. The eye-piece of a helioscope, provided with a shade in which light is absorbed, but not dispersed.

Solarisation. (*a*) Exposure to the action of the sun's rays. (*b*) In photography, reversal of photogenic action due to over-exposure to light.

Solarise. (*a*) To modify in some way by the action of solar rays. (*b*) In photography, to affect injuriously by over-exposure.

Solar Microscope. A microscope for which the sun is the source of light.

Solar Observatory. An astronomical observatory, specially equipped for the study of solar phenomena.

Solar Print. A photograph, usually enlarged, printed in a solar camera.

Solar-radiation Register. A sunshine recorder.

Solar-radiation Thermometer. A thermometer for measuring the intensity of solar radiation.

Solar Spectrum. The spectrum due to the refraction of a beam of sunlight.

Solferino. The colour of rosaniline.

Solid Angle. An angle made by three or more plane angles touching one another and meeting in a point.

Solefugous. Shunning sunlight; fleeing from the light of day; nocturnal.

Solisequious. Following the course of the sun.

Sol-lunar. Proceeding from, or due to, the influence of both the sun and the moon.

Sothiac. Connected with Sirius, the dog star.

Sothic. Of, or pertaining to, Sirius.

Soul-blindness. A state in which the power of interpreting visual impressions is lost, without the sight being impaired.

Source primitive de lumière (Fr). Self-luminous body.

Source Secondaire de lumière (Fr). A body shining by reflected light.

Sous-exposition (Fr). Underexposure.

Spaces of Fontana. Cavities in the lax, spongy tissues, filling up the sinus of the anterior chamber of the eye.

Spark-condenser. A glass tube or other vessel, within which electric sparks may be produced for chemical or spectroscopic tests.

Sparklessly. Without the emission of sparks.

Sparklet. A minute spark or scintillating speck.

Sparklingness. Vivid and twinkling lustre.

Spatial or Spacial. Of, relating, or pertaining to, space

Spatially or Spacially. Having reference to, or as regards, space.

Specillum. (*a*) A lens; an eyeglass. (*b*) A surgical probe.

Spectacled. Furnished with, or wearing, spectacles.

Spectacle-gauge. An appliance for determining the proper distance between spectacle-glasses.

Spectacle-glass. (*a*) A spectacle lens. (*b*) Optical-glass.

Spectacle-maker. One who makes spectacles and similar instruments.

Spectacles. A pair of lenses set in a frame to correct, or assist, the sight.

Spectacular. Relating to spectacles or other glasses for assisting vision.

Spectral. Pertaining to ocular spectra, or to the solar, prismatic, or diffraction spectrum.

Spectralanalyse (G). Spectrum analysis.

Spectralapparat (G). Spectroscope.

Spectral Image. An image persistent in the retina, after the excitant cause is withdrawn.

Spectrobolometer. A bolometer mounted in conjunction with a spectroscope, so that the heat energy in different regions of spectra may be compared.

Spectro-colorimeter. An ophthalmospectroscope, used in detecting colour blindness.

Spectrogram. A map or representation of a spectrum, generally produced photographically.

Spectrograph. A spectroscope in which a photographically sensitive plate replaces the eye-piece.

Spectrographic. Relating to the process or results of photography as applied to the study of spectra.

Spectrography. The art of using the spectrograph.

Spectroheliograph. An instrument for photographing the sun and his prominences.

Spectrological. Relating to spectrology.

Spectrology. The scientific study of spectra.

Spectrometer. An apparatus for measuring the angular deviation of a pencil of light subjected to refraction or diffraction.

Spectrometric. Relating to spectrometry or the measurement of the deviation of a ray of light.

Spectromicroscopical. Relating to spectroscopic observations made in connection with the microscope.

Spectrophone. An apparatus in which the principle of the radiophone is applied to the purposes of spectrum analyses.

Spectrophonic. Relating to the process or results of radiophony as applied to the study of spectra.

Spectrophotometer. An apparatus for measuring the relative intensities of spectral hues.

Spectrophotometric. Pertaining to the spectrophotometer, to its use, or to observations made with it.

Spectrophotometry. The art of using the spectrophotometer.

Spectropolariscope. A combined spectroscope and polariscope.

Spectropyrometer. A form of spectrophotometer applied to the measurement of high temperatures.

Spectroscope. To use the spectroscope; to study by means of observations made with it.

Spectroscope. An instrument used in spectrum analysis.

Spectroscopic, Spectroscopical. Pertaining to spectroscopy, or the spectroscope.

Spectroscopically. In a spectroscopic manner.

Spectroscopist. One skilled in spectroscopy.

Spectroscopy. The branch of science concerned with the use of the spectroscope and with spectrum analysis.

Spectrum. The polychromatic band into which any beam of light is resolved after passing through a prism or a grating.

Spectrum Analysis. Analysis by means of the spectroscope.

Specular. Of, or pertaining to, a mirror.

Speculum. (*a*) A mirror. (*b*) An attachment to, or part of, an optical instrument. (*c*) A surgical instrument, by means of which internal parts of the body are rendered capable of being observed.

Speed-gauge, Speed-indicator. An operameter, tachometer, or velocimeter.

Speed-recorder. A self-recording speed-gauge.

Speed-sight. One of a pair of sights on a cannon, adjustable in accordance with the estimated speed of a moving ship.

Sphenic. Wedge like.

Sphenoid, Sphenoidal. Resembling a wedge.

Spheral, Spheric, Spherical. (*a*) Sphere-shaped. (*b*) Of, or pertaining to, a sphere or spheres.

Sphere. An orbicular field or path; an orbit, as of an eye.

Spherical Aberration. Indistinctness in an image due to the fact that the component rays of a pencil of light incident on the marginal portion of the lens or mirror by which the image is formed are not accurately focused after refraction or reflection.

Spherical Co-ordinates. Distances measured on a sphere from axes which are great circles.

Spherical Lune. The portion of the surface of a sphere included between two great circles.

Spherically. In the form of a sphere or part of a spherical surface.

Spherical Mirror. A reflecting portion of a spherical surface.

Sphericle, Spherule. A minute sphere.

Spheriform. Sphere-shaped.

Spherocrystal. A mineral occurring in spherical form with fibrous-radiate structure.

Spherometer. A micrometer adapted for determining the radii of spheres (Weell-Spherometer).

Spiegelbeobachtung (G). Mirror observation.

Spinthariscope. An apparatus designed to exhibit the emanations of radioactive substances.

Spintheropia. A disease of the vitreous humour of the eye.

Spiracle, Spiraculum. An aperture or orifice.

Spirit-level Quadrant. An instrument for determining altitudes by the use of the spirit level.

Spirometer. An apparatus for measuring the extreme differential capacity of the human lungs and the forces of expiration and inspiration.

Spirometric. Relating to, or ascertained by means of, the spirometer.

Spirometry. The use of the spirometer in measuring the capacity of the lungs.

Spot-lens. A condenser having a permanent axial stop.

Spy-glass. A small hand telescope.

Square. An instrument for use in marking or comparing angles. That form used for determining right angles is called the normal square.

Squint. See Strabismus.

Stage. The platform on which the microscopic object is placed.

Stage-forceps. A clamp for supporting an object on the stage of a microscope.

Stage-micrometer. A micrometer attached to the stage of a microscope.

Stage-plate. A glass plate having a ledge adapted to support an object on the stage of a microscope when the stage is inclined.

Standard Acuteness of Vision. The power of the eye to distinguish letters and characters occupying an angle of 5 minutes.

Stanhope Lens. A simple microscope, consisting of a thick double convex lens of unequal curvatures.

Stanhoscope. A plano-convex modification of the Stanhope lens.

Stannotype. A tintype photograph.

Staphyloma. A grape-like swelling of the cornea or sclerotic.

Starblind. Seeing obscurely, as from cataract.

Statical Manometer. A barometer consisting of a sealed bulb delicately balanced.

Static Refraction. The refraction of the eye when the accommodation is wholly relaxed.

Stationary Vibration. Vibration in which the nodes remain at fixed points.

Statoscope. A sensitive aneroid of special construction, having an abridged scale for measuring minute variations of atmospheric pressure.

Stauroscope. A polariscope constructed for the use of parallel light.

Stauroscopic. Of, or relating to, the stauroscope.

Stauroscopically. By means of the stauroscope.

Steinheil's Cone. A small solid glass cone, the base of which is convex, whilst the opposite face is concave; occasionally employed in very high degrees of myopia.

Stellwag's Sign or Symptom. An abnormal retraction of the eyelids with diminished blinking.

Stenochromy. The art of printing several colours at one impression.

Stenopaic, or **Stenopæic.** Having a small or narrow opening.

Stenopaic Slit. An opaque plate with a narrow slit, employed in determining the differences of ocular refraction in various azimuths.

Stenopaic Spectacles. Opaque eyeshades having small central apertures.

Stereochrome. A stereochromic picture.

Stereochromic. Pertaining to, or produced by, stereochromy.

Stereochromy. A method of pigmentation or painting with water glass as a medium.

Stereochromoscope. A form of stereoscope giving a naturally coloured, stereoscopic image of an object.

Stereo-comparator. A range-finder.

Stereogram, Stereograph. A double picture or diagram for producing, by optical superposition of the parts thereof, an appearance of solidity.

Stereographically. In a stereographic manner; by delineation on a plane.

Stereography. The art of delineating the forms of solid bodies on a plane.

Stereomonoscope. An instrument for exhibiting a picture in relief upon a ground glass screen.

Stereo-photo-duplicon. An instrument giving stereoscopic views by means of a single lens.

Stereopticon. A pair of matched optical lanterns mounted near to, and parallel with, one another.

Stereoscope. An instrument for effecting the superposition of two slightly dissim lar views, one of which is presented to each eye.

Stereoscopic, Stereoscopical. Pertaining to the stereoscope.

Stereoscopic Image. An image in relief due to the production on corresponding portions of the retina of each eye of an optical image appropriate to that eye.

Stereoscopic Microscope. A binocular microscope, giving a stereoscopic image.

Stereoscopic Relief. The sensation of solidity due to the fusion of dissimilar retinal images.

Stereoscopic Vision. That form of vision when the images formed on the retinas of both eyes are combined into a single representation in relief.

Stereoscopist. One versed in the use, or manufacture, of stereoscopes.

Stereoscopy. The use or construction of stereoscopes.

Stereotelescope. A binocular telescope in which the inter-objective distance is greater than the interocular.

Stereotomy. The science or art of cutting solid bodies into sections.

Stereotrope. A stereoscopic thaumatrope.

Stethograph. Same as pneumograph.

Stigmatic. Bringing to a point.

Stilling's Canal. A canal filled with fluid in the centre of the vitreous humor, running from the optic nerve to the lens.

Stoke's Lens. An instrument consisting of two plano-cylindrical lenses of equal focal distance, employed in diagnosing astigmatism.

Stop. A perforated screen inserted in the field of view to cut off the marginal rays of a lens, and thus to obviate or limit spherical aberration.

Strabismal, Strabismic, Strabismical. Pertaining to, affected by, or involving strabismus.

Strabismus. Squinting; a defect of vision in which the visual axes do not meet at the desired objective point.

Strabismus deorsum vergens (L). Downward squint, in which the visual axis of the squinting eye passes lower than the fixation-point.

Strabismus sursum vergens (L). Upward squint, in which the visual axis of the squinting eye passes higher than the fixation-point.

Strabisometer, Strabometer. An instrument for the measurement of strabismus.

Strahlenbüschel (G). Pencil of rays.

Strahlengang (G). Path of the ray.

Strahlenkegel (G). Cone of rays.

Streblosis. The angle through which it is necessary to rotate an element of a figure to bring it into coincidence with the corresponding element of a given conformable figure.

Streaked. Striped; striate; having streaks or stripes.

Stria. An imperfection in the shape of a line or band.

Stroboscope. A phenakistoscope, used for studying the periodic motions of a body.

Stroboscopic. Pertaining to the stroboscope, or the principle involved therein.

Stumpfwinkelig (G). Obtuse-angled.

Sty, Stye. An inflamed swelling on the edge of the eyelid.

Subangular. Slightly angular; bluntly angulated.

Subangulate, Subangulated. Somewhat angled or sharp.

Subapical. Situated below the apex.

Subcentral. (*a*) Being under the centre. (*b*) Nearly central; a little eccentric.

Subcentrally. (*a*) Under the centre. (*b*) Nearly centrally.

Subconcave. Slightly concave.

Subconical. Somewhat, or not quite, conical; conoidal.

Subcontrary. Contrary in an inferior degree.

Subconvex. Somewhat convex.

Subcylindric, Subcylindrical. Nearly or somewhat cylindrical.

Subdented. Indented beneath.

Subdepressed. Somewhat depressed or flattened.

Subdivisible. Susceptible of subdivision.

Subdivisional. Of or pertaining to subdivision.

Subdivisive. Arising from subdivision.

Subduce. To subtract arithmetically.

Subduct. To draw away from under.

Subelliptic. Between ovate or oblong and elliptic.

Subequal. (*a*) Nearly equal. (*b*) Related as are several numbers of which no one is so great as the sum of the rest.

Subequilateral. Nearly equilateral.

Subflavour. Yellowish.

Subfrontal. Situated under the front, face, or fore-end.

Subfuscous, Subfusc, Subfusk. Brownish; moderately dark; duskish.

Subgelatinous. Imperfectly or partially gelatinous.

Subglobose. Nearly globose; subspherical; spheroidal.

Subglobular. Nearly globular.

Subglobulose. Somewhat globulose.

Subhexagonal. Six-sided, but not forming a regular hexagon.

Subhyaloid. Situated beneath the hyaloid membrane of the eyeball.

Subimpressed. Slightly impressed; having indistinct impressions.

Subindicate. To indicate in a secondary or lesser degree.

Subjective Sensation. A sensation which is not caused by any object exterior to the body.

Subjective Symptoms. Those observed by the patient.

Subjectivity. The absence of objective reality; illusiveness.

Sublunate. Approaching the form of a crescent; subcrescentic.

Submarine Telescope. A telescope used for observing submerged objects.

Subnormal. Abnormal by defect or deficiency.

Subnormality. The state or condition of being subnormal.

Subocular, Suboptic, Suborbital. Situated under the eye.

Suborbicular, Suborbiculate. Nearly orbicular.

Suboval. Nearly or somewhat oval.

Subovate. Somewhat or nearly ovate.

Subovoid. Nearly or somewhat ovoid.

Subparallel. Nearly or not quite parallel.

Subpellucid. Nearly or almost pellucid.

Subpentangular. Imperfectly pentagonal; having five sides of different lengths, or five rounded off angles.

Subpermanent. Remaining for a considerable time, but with gradual loss of intensity.

Subpyramidal. Approximately pyramidal.

Subquadrangular. In form between quadrangular and oval.

Subquadrate. Squarish.

Subrectangular. Approaching to a right angle in form; a little obtuse or acute.

Subretinal. Lying beneath the retina.

Subsclerotic. Beneath the sclerotica.

Substage. A stage situated beneath the ordinary stage of a compound microscope.

Subtend. To extend under or be opposite to.

Subtractive. Having the minus sign (—).

Subtranslucent. Imperfectly translucent.

Subtransparent. Imperfectly transparent.

Subtriangular. Imperfectly triangular.

Subtrigonal, Subtrigonate. Nearly or somewhat triangular.

Subtrihedral. Somewhat like a three-sided pyramid.

Sucher (G). Finder.

Suction-Anemometer. An anemometer in which the velocity of the wind is measured by the diminution of pressure which it causes.

Sunbeam. A ray of the sun.

Sunbow. An iris produced by the refraction of sunlight in any rising spray or vapour.

Sun-glow. A diffused solar corona due to fine atmospheric particles.

Sun-picture. A photograph.

Sun-proof. Impervious to the sun's light.

Sunshade. (*a*) A coloured glass screen used in solar observations. (*b*) A tube projecting beyond the objective of a telescope to cut off oblique light.

Sun-southing. The transit of the centre of the sun over the meridian at apparent noon.

Sun-wake. The rays of the setting sun reflected on water.

Sunwise. In the direction of the sun's apparent motion.

Support (Fr). Holder.

Supra-orbital, Supra-orbitar, Supra-orbitary. Situated over, or upon, the orbit of the eye; roofing over the eye socket.

Surexposition (Fr). Over exposure.

Sursumduction. The power of the two eyes of fusing two images when one eye has a prism vertically before it.

Surveyor's Transit. A form of theodolite, in which a compass needle is fixed at the centre of the graduated circle.

Symblepharon. Adhesion of the lids to the eyeball, through burns or wounds.

Symblepharosis. Adhesion of the eyelids to each other, or to the eyeball.

Symmetral. (*a*) Pertaining to symmetry. (*b*) Commensurable.

Symmetrisation. The act or process of symmetrising.

Sympalmograph. An apparatus for the registration of Lissajou's curves.

Sympiesometer. (*a*) A syphon-like pressure gauge

used for determining the velocity of a current. (*b*) A short syphon barometer having the Torricellian vacuum replaced by gas or air.

Synaugeia. That part of the earth's or moon's surface where the sun is wholly above the horizon.

Synchisis Scintillans. An accumulation of sparkling crystals floating in the vitreous.

Synchronise. (*a*) To agree in time. (*b*) To cause to be synchronous.

Synchronism. Simultaneous; concurrence of two or more events in time.

Synchrony. Simultaneity.

Syndrome. Concurrence.

Synechia. A morbid union of the iris to the anterior capsule of the lens, or to the posterior surface of the cornea.

Synergetic. Working together; co-operating.

Synizesis. A closure of the pupil of the eye, causing total loss of vision.

Synophthalmia. The condition of having only a single eye in the centre of the forehead (Cyclopia, Arrhinencephalia).

Syntonic, Syntonous. Intense.

Syntypic, Syntypous. Belonging to the same type.

Systéme d'arriere (Fr). Back combination.

Systéme d'avant (Fr). Front combination.

T.

Tabasheer, Tabashir. A translucent opaline material which becomes transparent by absorption of water.

Tacheometer, Tachometer, Tachymeter. (*a*) An instrument for measuring the velocity of a current or of rotation. (*b*) A surveying instrument adapted for rapid work.

Tacheometry, Tachometry, Tachymetry. The art of measurement with a tachometer.

Tachytomy. The art of operating quickly.

Tachyscope. An apparatus for representing motion.

Taction. (*a*) The act of

touching; palpation. (*b*) The perception of objects by tactual sensation.

Tactometer. An instrument resembling a pair of dividers used for the measurement of tactile sensibility (Esthesiometer).

Tactually. By means of, or as regards, touch.

Talbotype. The negative photo process on paper invented by Fox Talbot (Calotype).

Tangebile. A tactile sensation or object.

Tangency. The state of being tangent.

Tangent. (*a*) Tangential. (*b*) A line which touches a curve at a single point. (*c*) A goniometrical ratio. (*d*) To bear the relation of a tangent to.

Tangental. Tangential.

Tangent Screw. A screw serving to adjust two pieces relatively to one another.

Tangibleness. Tangibility.

Tannin Plate. A collodion dry plate treated with tannin.

Tapedum Lucidum. A modified choroid.

Tapetum. The pigmentary layer of the retina.

Taraxis. Slight inflammation of the conjunctiva.

Tarsorrhaphy. An operation upon the eyelids.

Tasimeter. An instrument for measuring very minute variations of pressure, temperature, moisture, etc.

Tasimetric. Pertaining to the measurement of stresses, or to the tasimeter.

Teichopsia. Temporary amblyopia with subjective visual images.

Teilkreis (G). Divided circle.

Tenon, Capsule of. The thin membranous sac surrounding the eyeball (Tunica vaginalis oculi).

Teinoscope. A prism telescope.

Telebarometer. A barometer, of which the indications are transmitted electrically to a distance.

Telecentric. Said of an optical system in which the emergent principal rays are made parallel to one another by placing a stop at the first principal focus.

Telegraphophone. (*a*) An apparatus for reproducing at a distance the sounds

corresponding to a graphophonic record. (*b*) A telephonic apparatus for producing a graphophone record at a distance.

Telehydrobarometer. An instrument for recording at a distance the depth of water or other liquid in a reservoir.

Teleiconograph, Teliconograph. A telescope combined with a camera lucida.

Telelograph. A semaphore signalling apparatus.

Telemanometer. A manometer, of which the indications are transmitted electrically to a distance.

Telemeter, Teleometer. A distance-finding instrument or apparatus.

Telengiscope. A combined telescope and microscope.

Telephonograph. An apparatus for making an automatic record of a message received by telephone.

Telephotal. (*a*) Of, or pertaining to, a telephote. (*b*) Relating to the transmission of light to a distance.

Telephote. An instrument for the reproduction of optical images at a distance, as by means of electricity.

Telephotograph. (*a*) A photographic image produced through the agency of a telephote. (*b*) A photograph produced by means of a telephotographic camera.

Telephotographic Lens. Essentially a combination of a positive with a negative lens system, as in the opera glass, by means of which an equivalent focal length is obtained greater than the distance between the first lens surface and the image plane.

Telephotography. The art of photographing distant objects by means of a telephote or a telephotographic camera

Telepolariscope. A combined telescope and polariscope.

Teleradiophone. A radiophonic telephone.

Telescope. An optical instrument for the inspection of distant objects.

Telescope-Driver. A clockwork mechanism by which a telescope is moved in accordance with apparent sidereal motion.

Telescope-sight. A small telescope mounted as a rear sight on the barrel of a firearm or a piece of ordnance.

Telescopic. (*a*) Of, or pertaining to, the telescope. (*b*) Visible only with the help of a telescope.

Telescopical. Telescopic.

Telescopic Sight. A device for setting a telescope on an object.

Telescopist. One using, or being experienced in using, the telescope.

Telescopy. The art or science of using or making telescopes.

Telesmatic Apparatus. An apparatus for printing photographs at a very rapid rate.

Telespectroscope. A telescope combined with a spectroscope.

Telestereographic Camera. An apparatus for the production of telestereoscopic photographs.

Telestereoscope. An optical apparatus for increasing the apparent relief of distant objects.

Telestereoscopic Spyglass. An opera or field glass for increasing both the apparent magnitude and the apparent solidity or relief of distant objects.

Telethermograph. A self-recording telethermometer.

Telethermometer. A thermometer, of which the indications are automatically transmitted to a distance.

Teletopometer. A range-finder, in which two telescopes are employed.

Tellurion. An instrument for showing in what manner those causes operate which produce the succession of day and night and the changes of the seasons.

Telotype. (*a*) A printing electric telegraph. (*b*) An automatically printed telegram.

Temperature. The intensity of sensible heat, or intermolecular vibration.

Temperature-curve. A curve exhibiting the variations of temperature during a given period.

Temps de pose (Fr). Exposure.

Tenebrific. Producing darkness.

Tenebrose, Tenebrous. Dark.

Tensibility. The property of being tensible or ductile.

Tensiled. Made tensile.

Tensility. The quality of being ductile; tensibility.

Tenuate. To make thin.

Tepify. To make or to become moderately warm.

Tepor. Gentle heat.

Terebrate. To bore; perforate.

Terminal Ray. The limiting ray of a pencil of rays.

Ternary. (*a*) Proceeding by threes; consisting of three. (*b*) A group of three.

Ternate. Arranged in threes.

Terrestrial Radiation Thermometer. A minimum thermometer used to register the cooling of the earth's surface by nocturnal radiation.

Terrestrial Refraction. The atmospheric refraction which makes terrestrial objects appear misplaced.

Terrestrial Telescope. A telescope giving an uninverted image of the object viewed.

Tessarace. A tetrahedral summit.

Tessarescædecahedron. A solid having fourteen faces.

Test-object. A very minute, or minutely-marked, object, used for testing the resolving and defining power of a microscope.

Test-plate. A finely-ruled plate used as a test-object.

Test-types. Letters of various sizes used in testing the acuteness of vision.

Tetragon. A quadrangular figure.

Tetragonal. Having four angles.

Tetragram. A figure formed by four right lines.

Tetrahedron. A solid included between four plane faces, especially the regular tetrahedron, or triangular pyramid, of which the base and sides are equilateral triangles.

Tetrahexahedron, Tetrakishexahedron. A solid bounded by twenty-four equal triangular faces, of which four correspond to each face of a cube.

Tetrant. A quadrant.

Tetraspherical. Relating to four spheres.

Tetraxial, Tetraxile. Having four axes.

Thaumatrope. An apparatus for the exhibition of figures apparently in motion, due to effects of visual persistence (Enorthotrope, Zoetrope, Phenakistoscope, Zoepraxiscope).

Theatre-glass (G). Opera-glasses.

Theodolite. A surveying instrument for measuring horizontal and (in many cases) vertical angles, upon a horizontal graduated circle.

Theodolite-magnetometer. A combined declinometer and magnetometer.

Theodolitic. Of, or pertaining to, a theodolite; made by means of a theodolite.

Theorem. A demonstrable theoretical proposition.

Theory. A conception or account of how something may have come about, or could be carried out.

Thermal Analysis. The analysis of radiation from any source for the purpose of determining the relative intensity of luminous and non-luminous rays in different parts of the spectrum.

Therm-ammeter. An instrument for measuring the amperage of an electric current by means of the heat it is capable of generating in a circuit.

Thermetrograph, Thermometrograph. A self-registering maximum and minimum thermometer.

Thermically. In relation to, or as affected by, heat.

Thermic Balance. An instrument used for measuring very minute differences of radiant heat (Bolometer).

Thermobarometer. (*a*) A thermometric instrument adapted to be used as a hypsometer, by determination of the boiling point of water. (*b*) An instrument usable either as a mercurial barometer or a thermometer.

Thermogram. The record produced by a thermograph.

Thermograph. A continuously self-registering thermometer.

Thermology, Thermotics. The science of heat.

Thermo-luminescence. The property of various minerals to shine in the dark when hot.

Thermoscope. An instrument for indicating variations of temperature without measuring their amount.

Thermostat. An automatic regulator of temperature.

Thermostatics. The theory of the equilibrium of heat.

Thermotype. A picture impression developed by the action of heat.

Third Nerve. The nerve distributed to all the muscles of the eye except the superior, oblique, and external rectus (Motores Oculi).

Tide Dial. An instrument for showing the states of the tide at different hours.

Tide-gauge, Tide-meter. An apparatus for indicating or recording the movements of the level of water.

Tiefe des Focus (G). Depth of focus.

Time Exposure. Exposure for more than the fraction of a second.

Time-globe. A terrestrial globe rotated, by clockwork, relatively to a graduated ring, whereby the time at every point on the globe is shown simultaneously.

Tinter. A slide of plain coloured glass used in the production of moonlight or sunlight effects, or the like, by the magic lantern.

Tintometer. An apparatus for determining shades of colour by comparison with standard tints.

Tintype. Same as Ferrotype.

Tithonic. Actinic.

Tithonicity. Actinism; actinicity.

Tithonographic. Photographic; impressed by the tithonic rays of light.

Tithonometer. An instrument for measuring the intensity of radiation by means of its photo-chemical effect (Actinometer).

Tone. The harmonious relation of the colours of a picture.

Toric. Pertaining to torus; used in optics with reference to a lens whose surface is a portion of that of a torus.

Toroid. A solid of revolution generated by the rotation of an elipse about an axis in its plane, and parallel to one of its principal diameters.

Toroidal. Pertaining to a toroid; used in optics with reference to a lens whose surface is a portion of that of a toroid.

Torricellian Vacuum. A vacuum such as is formed over the surface of the mercury in a barometer.

Torus. A solid of revolution, generated by the rotation of a circle about any axis in its plane.

Toughened Glass. Glass hardened by treatment

analogous to that used in the hardening of steel.

Tourmaline Tongs. A device used to exhibit axial interference figures.

Tourner (Fr). To rotate.

Touroscope. An apparatus for viewing lantern slides and transparencies.

Total Reflection. The complete reflection of an incident beam of light which takes place at the bounding surface of transparent media when the angle of incidence is greater than the critical angle.

Trachoma. A form of conjunctivitis characterised by the unrestricted formation of follicles, producing permanent granular masses (Granular Conjunctivitis, Egyptian Ophthalmia).

Träger (G). Holder.

Trammel. (*a*) An ellipsograph. (*b*) A beam compass.

Transect. To cut across.

Transillumination. The process of passing light through; in Medicine, the process of throwing light through an organ of the body for the purpose of examining it.

Transit. (*a*) A surveying instrument for the approximate measurement of horizontal angles. (*b*) Contr. of Transit-circle or Transit-instrument.

Transit-circle. An astronomical telescope adjustable in the plane of the meridian (Meridian-circle).

Transit Instrument. An astronomical instrument for determining the times of the transits of celestial bodies across the meridian.

Translucence, Translucency. The property of being translucid.

Translucid, Translucent. Transmitting rays of light dispersively, as does alabaster.

Transmeridional. Forming an angle with or crossing a meridian.

Transparent. Having the property of transmitting rays of light.

Transparencies. Positive pictures on glass, intended to be viewed by transmitted light.

Transparency. The state or property of a body in consequence of which it permits the passage of rays of light.

Transparent Colours. Colours which transmit light.

Transparent Media. Substances which transmit light without dispersion.

Transsection. A section at right angles to the principal axis (Cross-section).

Trapezate, Trapeziform. Having the shape of a trapezium.

Trapezium, Trapeze. A plane figure contained by four straight lines of which no two are parallel.

Trapezohedron, Trapezihedron. (*a*) Any solid bounded by trapeziums. (*b*) A solid bounded by twenty-four equal and similar trapeziums.

Trapezoid. A plane figure contained by four straight lines of which two are parallel and two not so.

Trechometer, Trochometer. An instrument for measuring distances by counting the revolutions of a wheel (Odometer).

Triace. A trihedral solid angle or summit.

Triacontahedral. (*a*) Having thirty sides. (*b*) Bounded by thirty rhombs.

Trial-glasses. A graduated set of prisms and lenses used in vision testing.

Trial Lens. A lens used in testing the refraction of the eye.

Trial-sight. A case of lenses employed to test sight.

Triangularity. Triangular form.

Triangulate. To survey by dividing into triangles, of which the sides and angles are measured. (*2*) To determine or observe trigonometrically.

Trianguloid. Somewhat triangular in shape.

Triaxal, Triaxial. Having three axes.

Triblet-tubes. Thin telescopic tubes, such as are used in optical instrument making.

Triboluminescence. Luminescence excited by friction.

Trichiasis. Inversion of eyelashes, causing them to rub against the cornea.

Trichinoscope. An instrument for the inspection of meat.

Trichroic. Characterised by trichroism.

Trichroism. The exhibition (by transmitted light) of

three different colours in three different directions.

Trichromatic, Trichromic. Pertaining to, or characterised by, three colours or colour-sensations.

Triclinate, Triclinic. Pertaining to the inclination of three intersecting axes one to another.

Tricolour, Tricoloured, Tricolourous. Three-coloured.

Tridiametral. Having three diameters.

Trigon. A triangle.

Trigonal, Trigonous. Triangular.

Trigonic. Pertaining to a triangle.

Trigonoid. A plane figure composed of three arcs of circles of equal radii.

Trigonometer. An instrument for solving plane right-angled triangles by inspection.

Trihedral. Having three planes; three-sided.

Trilateral. Having three sides.

Trilinear. Composed of, or pertaining to, three lines.

Triorthogonal. Having three lines or systems of lines crossing at right angles to one another.

Tripart, Triparted, Tripartite. Divided into three parts.

Tripartient. Dividing into three parts.

Triplet Lens. A combination of three lenses, or lens systems.

Triplopia, Triplopy. A form of polyopia in which one object is seen as three.

Tripodal. Having or forming a tripod.

Tripodal Stand. A stand having three feet.

Trirectangular. Having three right angles.

Triskele, Triscele. A figure of three lines radiating from a point or small circle.

Trisoctahedron. A solid bounded by twenty-four equal faces, three corresponding to each face of an octahedron.

Trisulcate. Three-grooved; three-furrowed.

Trochilic. Pertaining to, or characterised by, rotary motion.

Trochilics. The science of rotary motion.

Trochlear Nerve. The nerve supplying the superior oblique muscle of the eye (Fourth Nerve).

Trousse (G). Combination set.

Tube. That part of a telescope into which the lenses are fitted.

Tube-compass. A drawing compass having tubular legs with sliding extension pieces.

Tunica Ruyschiana. The internal layer of the choroid.

Tuyau monture de l'objectif (Fr). Lens tube.

Two-lens Objective. An objective consisting of two lenses.

Typhloid. Having genetically defective vision, as a blindworm.

Typhlology. The sum of scientific knowledge concerning blindness.

Typhlosis. Blindness.

Type-wheel. A disc or revolvable sector, bearing letters in relief on its periphery.

U.

Udometer. A rain-gauge.

Udometric. Pluviometric.

Ueberbelichtung (G). Overexposure.

Ulcus Rodens. A chronic inflammation, beginning on one margin of the cornea and eating its way to the opposite margin (Rodent Ulcer).

Ulcus Serpens. A destructive inflammation of the cornea peculiar to the debilitated and aged (Serpiginous Ulcer).

Ultramicroscopic, Ultramicroscopical. Too small to be seen or resolved with a microscope.

Ultra-red. Below red in the spectrum (Infra-red).

Ultra-violet. Situated above violet in the spectrum; more refrangible than the violet rays of light.

Umbra. A shadow or shade.

Umbral. Pertaining to a shadow.

Umbra Recta. Twelve times the cotangent of an angle.

Umbra Versa. Twelve times the tangent of an angle.

Unangular. Having no angles.

Under-corrected. A term applied to lenses in which the marginal rays are focused before the axial rays.

Under-tint. A subdued tint.

Unendlichkeit (G). Infinity.

Underlant. Undulating, undulatory.

Undulary. Undulating.

Undulate. Wavy, having a waved surface.

Undulate. To have a wavy motion; to cause to vibrate.

Undulation. The art of undulating; wave-motion.

Undulatory Theory. The theory that light consists of a kind of undulatory motion, produced by the luminous body in the luminiferous ether, which is supposed to pervade all space.

Undurchsichtig (G). Opaque.

Uniaxial, Uniaxal. Having but one axis (Monaxial).

Unicolour, Unicolorate, Unicolorus. Unicoloured; whole-coloured.

Unicornial. Having but one cornea.

Unific. Making one; forming unity.

Unilamellate, Unilaminar, Unilaminate. One-layered.

Unilateral. One-sided.

Unimucronate. Having only one tip or point.

Uniocular. Monocular.

Unipartite. Not separated into parts.

Uniplanar. Lying in our plane.

Unsymmetric, Unsymmetrical. Lacking symmetry.

Unterbelichtung (G). Under exposure.

Untersuchung (G). Examination, investigation.

Upright Image. An enlarged image of the fundus of the eye, seen with the ophthalmoscope, without the interposition of a bi-convex lens.

Upsetting Thermometer. A thermometer, of which the thermetric index has its motion arrested by inverting the instrument, thus causing the temperature-indication at the moment of inversion to be registered.

Uranic. Astronomical.

Uranographist. One versed in the science of the stars.

Uranography, Uranology. The science of the stars.

Uranolite. A meteorite.

Urinometer. A hydrometer for testing the density of urine.

Uranometry. (*a*) The measurement of inter-stellar distances. (*b*) A description of the principal fixed stars as to their positions, magnitudes, etc.

Uranoscopy. Ocular observation of the heavenly bodies.

Urethroscope. An instrument used for extending the urethra, with the object of allowing the membrane lining it to be examined.

Ustulate. Blackened, as if scorched.

Uvea. The pigmented posterior surface of the iris.

Uveal. Pertaining to, or forming, the uvea.

Uveitis. Inflammation of the uvea.

V.

Vacuum. Space void of ponderable matter.

Vacuum-tube. A glass tube having terminal conductors sealed therein, and containing rarefied gas which acts as a rheophore to electrical discharges.

Vernier-scale Sight. A back-sight that can be accurately adjusted by means of a vernier.

Ventral Segment. A loop of a stationary wave.

Veränderlicher Winkel (G). Adjustable angle.

Vergency. The reciprocal of the focal distance of a lens; a measure of the divergence, or convergence, of a pencil of rays.

Vergrössern (G). To enlarge.

Vergrösserung (G). Magnification.

Verifier (Fr). To ascertain, to determine.

Verkleinern (G). To reduce.

Vermögen (G). Power.

Vernier. A subsidiary scale, adjustable longitudinally, with reference to a fixed scale, of which the graduation differs somewhat from that of the first (Nonius).

Verre (Fr). Glass.

Versicolour, Versicolourate, Versicoloured, Versicolorous. Polychromatic.

Vertical Diplopia. Diplopia, in which one image appears higher than the other.

Vertical Illuminator. An illuminating device within a microscope, by which light entering the side of the tube above the objective is reflected down upon the subject.

Verzeichnung (G). Distortion.

Vibrant. Vibrating.

Vibratile. Susceptible of entering into vibration; vibratory.

Vibratility. Disposition to vibration.

Vibratinuncle. A slight vibration.

Vibration. The act of vibrating; a repeated periodic motion between two extreme positions.

Vibrational. Pertaining to, or of, the nature of vibration.

Vibrative. Causing vibration; vibratory.

Vibratory. Of, or pertaining to, vibration or oscillation.

Vibroscope. An instrument for observing, or registering, vibrations.

View. Examination by the eye; power of seeing, or limit of sight.

View-measurer. A device for measuring the dimensions of the image reflected on the sensitive plate.

View-telescope. An accessory telescope attached to a spectroscope.

Vignetter. A mask or screen used in the production of vignetted photographs.

Violaceous. Violet or purplish; blue, with a tinge of red.

Violescent, Violascent. Tending to a violet colour.

Virescence, Viridescence. Greenness.

Virescent, Viridescent. Becoming green; greenish.

Virtual Focus. The point at which divergent rays would meet if their direction were reversed.

Virtual Image. An image apparent to the eye, but not capable of being reproduced on a screen, due to the imaginary prolongation of rays through a lens or a mirror.

Vis de rappel (Fr). Focusing screw.

Visibility. The state of being visible; the quality of being perceivable by the eye.

Visible. That which can be perceived by the eye.

Visibleness. Visibility.

Vision. The act of seeing, sight.

Vision, Field of. The entire area before the eye, from which, when at rest, it can receive impressions of light.

Visircheibe (G). Focusing screen.

Visive. Of, or pertaining to, the power of seeing; visual.

Vis micrométrique (Fr). Micrometer screw.

Visual. Of, or pertaining to, or resulting from, the sense of sight.

Visual Acuity. The ability to recognise form.

Visual Angle. The angle which is included between lines drawn from the extremities of any object to the first nodal point of the eye.

Visual Axis or Line. The straight line passing through the centres of the pupil and macula lutea. It makes an angle of 5° with the optical axis of the eye.

Visual Cone. A cone, the vortex of which is at the eye, whilst the marginal lines touch the boundaries of a visible object.

Visual Field. The solid angle of view of the eye.

Visual Rays. Light rays considered as excitative of vision.

Visual White. The pigment of the retina in a fully solarised condition.

Visual Yellow. The pigment of the retina in a partially solarised condition.

Visualisation. The act of visualising or the state of being visualised.

Visualise. To make visual or visible; to render that which is perceived only by the mind apparently visible to the eye.

Visuality. (*a*) The state or property of being visible. (*b*) A mental picture.

Visually. By sight; with reference to vision.

Visual Plane. The plane including the visual axes of the eyes.

Visual Point. The centre of vision.

Visual Purple. The photosensitive matter of the retina; rhodopsin.

Visuometer. An instrument for measuring the range of vision.

Vitesse (Fr). Velocity.

Vitreocapsulitis. Inflammation of the membrane covering the vitreous humour of the eye.

Vitreous. Pertaining to, resembling, or consisting of glass.

Vitreous Humor. A delicate jelly or semi-fluid, filling the sclerotic chamber of the eye.

Vitrescence. The state of becoming glassy.

Vitrescent. Turning into glass; tending to become glassy; hyalescent.

Vitrescible. Capable of being turned into glass, or of becoming glassy.

Vitreum. The corpus vitreum or vitreous humour of the eye.

Vitric. Pertaining to glass or any vitreous material.

Vitrics. (*a*) The study or history of glass and glass manufacture. (*b*) Glass and glassy materials in general.

Vitrifacture. The manufacture of glass.

Vitrification. The process of vitrifying.

Vitriform. Having the appearance of glass.

Vitrify. To become glass or glassy.

Vitrine. A glass show-case.

Vitreous Chamber. The portion of the cavity of the eyeball behind the lens.

Voir (Fr). To see.

Volution. A twist; a spiral turn.

Volvelle (Fr). A pair of lantern transparencies or other designs, superposed and movable one over the other for the purpose of showing variations.

Vortex. A fluid, the particles of which have rotatory motion.

Vorticles lentis (L). Star-like figures seen on the surface of the crystalline lens of the eye.

W.

Water-barometer. A barometer in which water is substituted for mercury.

Water-comparator. An apparatus used in standardising thermometers.

Water-lens. A lens in which water is one of the refracting media.

Water-poise. A hydrometer.

Water-telescope. (*a*) An optical instrument used for examining objects immersed at some depth under water. (*b*) A telescope, of which the tube is filled with water.

Water-thermometer. A thermometer in which water is substituted for mercury; used chiefly in determining the temperature or maximum density of water.

Watch-telescope. A small telescope used to ascertain the relative stability of the parts of a geodetic instrument.

Wave Frequency. The number of waves passing or reaching a point in unit time.

Wave-front. A line or surface of uniphasal particles in wave-motion.

Wave-length. The distance between any two particles of similar phase in the path of a wave.

Wave-line, Wave-path. The line along which any point in a wave front is propagated; a ray.

Wave-motion. A combination of motions of the kind resulting in a wave.

Wave-period. The time intervening between successive extreme displacements of any particle in wave motion.

Watery Prism. The refracting watery liquid in the corner between the lip of the eyelid and the cornea.

Wave-surface. A surface coinciding with an advancing wave front.

Wave Theory. See Undulatory Theory.

Weather-glass. A barometer or other meteorological appliance.

Wedge Compensator. A pair of quartz wedges used in some forms of polarimeters

for determining the polarised condition of a beam of light.

Wedge-micrometer. A graduated wedge used to measure the separation of two objects between which it is intruded.

Wedge-photometer. A graduated wedge of dark neutral-tinted glass.

Weitwinkel Objectiv (G). Wide-angle lens.

Wenham Prism. A quadrilateral prism used in the construction of binocular microscopes.

Welle (G). Wave.

Wellenlänge (G). Wave length.

Well-spherometer. A micrometer adapted for determining the radii of spheres (Spherometer).

Wheel-barometer. A syphon barometer, having a float, of which the motions are indicated on a dial.

White-cloud Illuminator. A device of plaster of Paris or ground glass for reflecting light.

White Light. Light coming directly from the sun and not having been decomposed.

Wide-angle Lens. A lens whose focus is very short compared with the length of its base.

Wind-gauge. (*a*) An anemometer. (*b*) A pneumatic pressure gauge. (*c*) A graduated attachment to the sights of a firearm.

Window-mirror. A mirror so fastened outside a window that persons beneath it may be seen from the interior of the room.

Winkel (G). Angle.

Winkelgetreu (G). Orthoscopic.

Winkelspiegel (G). Optical square.

Wire Micrometer. A micrometer of which the field is traversed by fine wires, arranged in parallel and intersecting series.

Wirklicher Brennpunkt (G). Real focus.

Wirksam (G). Effective.

Wirkungsweise (G). Action.

Word-blindness. Loss, through disease, of the ability to read, unaccom-

panied by blindness in other respects.

Working Distance. A term used specially with reference to microscope objectives, to denote the distance between the front focal or object plane and the first lens surface.

Wollaston Prism. Wollaston's camera lucida.

Wye-level. Same as Y-level.

X.

X Rays. Invisible rays of high penetrating power, produced when an electrical discharge is passed through a high-vacuum tube.

Xanthelasma. Slightly raised yellow tumors on the eyelids of elderly people.

Xanthocyanopsy. The existence of yellow and dark-blue colour senses, or of the power to distinguish yellow from blue, accompanied by blindness to red.

Xanthomas. Dirty-yellow tumors on the eyelid.

Xanthophane. A yellow colouring matter derived from the retina.

Xanthopsia, Xanthopsy. Yellow vision; white is seen as yellow, and blue as green.

Xanthopsin. Yellow pigment of the retina.

Xerophthalmos. A condition in which the cornea is dry and lustreless.

Xerosis. Atrophy and shrinking of the conjunctiva.

Y.

Y-level. A spirit-level, of which the telescope is rotatable, resting on "Y's."

Z.

Zeichenapparat (G). Drawing apparatus.

Zeit und Moment Verschluss (G). Time and instantaneous shutter.

Zeitaufnahme (G). Time exposure.

Zenithal. Of, or pertaining to, the zenith, or upper pole of the celestial horizon.

Zenith-sector. An astronomical telescope adapted for measuring the zenith-distances of stars.

Zenith-telescope. A geodetical instrument for determining the difference of zenith-distance between a pair of stars north and south of the zenith.

Zerstreuungskreis (G). Circle of dispersion.

Zerstreuungslinse (G). Negative lens.

Zerstreuungspunkt (G). Virtual focus.

Zoetrope, Zoepraxiscope. An instrument for producing a representation of objects in motion by superposing images upon the retina of the eye in quick succession (Thaumatrope or Phenakistoscope).

Zoetropic. Pertaining to, or adapted to, be shown by the zoetrope.

Zöllner's Lines. An optical illusion consisting in the apparent destruction of the parallelism of a series of parallel lines by reason of an obliquely intersecting line.

Zonenfehler (G). Zonal error.

Zonule of Zinn. A thin transparent membrane, extending from the ciliary processes to nearly the equator of the lens, where it is intimately connected with the anterior capsule (Ciliary Zone).

Zoogyroscope, Zoopraxinoscope. A form of zoetrope for the exhibition of a series of instantaneous photographs of moving animals.

Zusammenkitten (G). To cement.

SYMBOLS AND ABBREVIATIONS WITH THEIR ALTERNATIVES AND MEANINGS EMPLOYED BY VARIOUS AUTHORS

A. Ac. Acc. Accommodation.
A^c ..... Relative range of convergence.
Æt. Æ. .... Ætatis. Aged.
Ah ..... Hyperopic Astigmatism.
Ahm. Amh. Mixed Astigmatism.
Am. ..... Ametropia. Ametropic. Myopic astigmatism.
An ..... Anisometropia.
As. ..... Astigmatism. Astigmatic.
As. H. .... Hyperopic Astigmatism.
As. M. ... Myopic Astigmatism.
Ax ..... Axis.
B E ..... Both eyes. The eyes together. Oculi Una.
B D ..... Base (of prism) down.
B I..... " " in.
B O ..... " " out.
B U..... " " up.
C ..... Cylinder. Cylindrical. Convergence.
c. ..... Cum. With.
C^a ..... Relative range of accommodation.
Cc. ..... Concave. (Minus, or —).
cm. ..... Centimeter.
Con. ..... Convergence.
Crys. ..... Crystalline lens.
Cve. ..... Concave. Minus.
Cvx..... Convex. Plus.
Cx..... Convex. (Plus, or +).
Cyl. ..... Cylinder. Cylindrical.
D ..... Diopter.
Dcc..... Double Concave.
Dcx. ..... Double Convex.
E. Em. ... Emmetropia. Emmetropic.
—e. e. .... Minus every letter. None seen on the card.
F ..... Formula. Focal power of lens or mirror.
f ..... Focal length.
Ft. ..... Foot.
FP. ..... Farpoint (punctum remotum).
FV..... Field of Vision.
H..... Hyperopia. Hyperopic. Horizontal.

h .....Velocity constant.
Hl .....Hyperopia latent.
Hm. .....Hyperopia manifest.
Hor.....Horizontal.
Ht. .....Hyperopia total. Height of Bridge.
Hy. .....Hyperopia. Hyperopic.
H. As.....Hyperopic Astigmatism.
In. .....Inch,"
J.....Jaeger.
L .....Left.
L D .....Light difference.
L E .....Left eye (oculus sinister).
L M.....Light-minimum.
M.....Myopia. Myopic.
m .....Meter.
mm .....Millimeter.
Mer. .....Meridian.
M A.....Meter angle.
M As ....Myopic Astigmatism.
My.....Myopia. Myopic.
N .....Nasal.
n .....Frequency.
NA .....Numerical aperture.
NP.....Nearpoint Punctum proximum.
O .....Oculus. The eye.
O^2 .....Both eyes.
O D .....Oculus dexter. Right eye.
O D V ...Oculi dextri visus. Vision of the right eye.
O S .....Oculus sinister. Left eye.
O S V ....Oculi sinistri visus. Vision of the left eye.
O U .....Oculi utrique. The eyes together. Both eyes.
P. Pb. Pr. Presbyopia. Presbyopic.
P. or PP ..Punctum proximum. Near-point.
p. or pp. ..Ditto.
P^a.....Nearpoint of accommodation.
P^c.....Nearpoint of convergence.
Pc.....Periscopic.
Pcc. .....Periscopic concave.
Pcx.....Periscopic convex.
Pr.....Prism.
P D.....Pupillary (or interpupillary) distance. Prismatic diopter.
P L.....Perception of light.
P R or pr..Punctum remotum Farpoint.
R .....Right.
r .....Radius of curvature. Punctum remotum (farpoint).
R^a.....Farpoint of accommodation.
R^c.....Farpoint of convergence.
R E.....Right eye (Oculus dexter).
R T.....Reading test.
S .....Sight. Snellen.
s. .....Angle of deviation.
Sb. .....Strabismus.
S. Sph. ...Spherical. Spherical lens.
Sym. .....Symmetric.
T .....Temporal. Tension of the eyeball.
U .....Curvature of incident wave.
u .....Distance of lens or mirror from the object point.
V .....Visus. Vision. Visual acuity. Vertical. Curvature of resultant wave.

v.....Distance of lens ormirror from the image point.
V A.....Visual acuity.
Ver. .....Vertical.
w .....With.
Y S .....Yellow spot. Macula lutea.
β .....Index of refraction of the refractive substance.
λ .....Wave length.
μ.....Refractive index of glass.
°.....Degree.
′.....Minute. Foot.
″.....Second. Inch.
‴ .....Line.
△.....Prismatic diopter. Index of dispersion.
+.....Plus. Convex. Positive.
—.....Minus. Concave. Negative.
=.....Equal to.
>.....Greater than.
<.....Less than.
∟.....Right angles to.
⊥.....Perpendicular to.
∥.....Parallel to.
⌒.....Combined with.
∞.....Infinity (practically 20 ft. or 6m.)
℞ .....Recipe. Prescription.

THE GREEK ALPHABET.

For the benefit of those who may not have learnt Greek, I print below the Greek alphabet, which is constantly made use of in expressing optical and other mathematical data. The pronunciation of the letters is also given.

A α	alpha	N ν	nu
B β $\mathfrak{G}$	bēta	Ξ ξ	xi
Γ γ	gamma	O o	ŏmīcron
Δ δ	delta	Π π	pi
E ε	epsīlon	P ρ	rho
Z ζ	zēta	Σ σ ς	sigma
H η	hēta	T τ	tau
Θ θ ϑ	thēta	Y υ	ūpsīlon
I ι	iōta	Φ φ	phi
K $\varkappa$	kappa	X χ	chi
Λ λ	lambda	Ψ ψ	psi
M μ	mu	Ω ω	ōmĕga

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